**CATÓLICA-LISBON SCHOOL OF BUSINESS & ECONOMICS**


# Executive Compensation Inside Family-Controlled Firms: Is Self-Motivation Enough?

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# Abstract

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The purpose of this research is to analyse the differences in chief executive officer (CEO) pay-to-performance sensitivity in family and non-family controlled firms. The corporate governance literature argues that CEOs in family businesses have superior incentives with regards to maximizing firm performance and therefore require less compensation-based incentives. In order to validate such assumptions, an analysis was carried out to test whether family CEOs´ total compensation and performance-based incentives are lower than in non-family controlled firms. Employing a fixed effects panel data regression on a sample of 80 firms it is shown that neither total pay nor equity-based compensation seems to be affected by the ownership structure of the firm. Furthermore, the change in the compensation scheme for a firm that replaced a family CEO with a non-family executive was studied. The case study suggests that family controlled firms should increase compensation of non-family related CEOs.

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# Preface

This research was supported by Professor Zoltán Novotny-Farka from Lancaster University Management School and Professor Geraldo Cerqueiro from Católica Lisbon School of Business and Economics. I would especially like to show my gratitude to Professor Zoltán for providing insights and expertise that greatly assisted the research.

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# Section I - Introduction

Finding the most efficient compensation practices that mitigate agency conflicts between managers and shareholders in companies has been widely addressed in corporate finance literature. The underlying assumption is that conflicts of interest and their inherent costs arise when one party (the agent) performs work delegated to it by another (the principal). In large public listed corporations, it is even harder or costly for shareholders to monitor the performance of its managers. With this said, specific compensation practices, particularly equity-based pay, have been developed to overcome this principal-agent cost and align interests between managers and their control of the firm, and shareholders and the ownership of the company.

Both traditionally and recently, evidence has shown family-run organisations as the preeminent form of business across the world (e.g. Colli et al., 2013). In the United States ("U.S.") alone, family-run companies contribute at least around 30% of the gross domestic product ("GDP"), which employs approximately 27% of the national workforce (Astrachan & Shanker, 2003). Within the domain of publicly traded companies, the emphasis of the present research, family businesses comprise over 35% of the Standard & Poor's 500 index[1] companies ("S&P 500") (Anderson & Reeb, 2003). These statistics show not only how significant family-firms are in the economic sphere, but also the potential consequences of agency problems between owners and managers.

This paper aims to contribute to this debate by employing panel collected between 2000 and 2010 for a sample of companies listed on the S&P 500. Given the aforementioned weight of family business in the U.S. stock markets, they offer suitable and interesting range of

[1] The S&P 500 is a market value weighted index of the biggest 500 U.S. large cap stocks and is designed to be a leading indicator of U.S. equities universe.

companies (including sector diversity) in which to study how family ownership combined with control influences executive compensation schemes.

Over this article, the analysis carried out considers cash compensation, equity-based compensation and total compensation as compensation components. In addition, the pay-to-performance sensitivity will be measure by *Delta*[2]. By engaging a test of difference of means it is possible to investigate the fluctuations of compensation structure that companies use to incentive CEOs, whereas a fixed effect model is used to control for firm and CEO characteristics and study the significance of total compensation that arises from either cash or equity compensation. Thus, the evolution of the compensation scheme of Tellabs Inc ("Tellabs") is analysed to assess the impact of CEO replacements. The company provides a real case of a family controlled firm who replaces its CEO by a non-family CEO, and also the reverse action, being a key analysis to understand how compensation schemes actually change.

The interaction between the family´s control and the executive´s compensation for their management can contribute to ease agency conflicts. While compensation should be engaged to align interests between shareholders and managers, family involvement provides a clear incentive to control management and ensure that they perform in the best interest of shareholders. Nevertheless, the positive impact generated by family control on reducing agency problems may create an adverse effect on compensation packages. Family members in their proprietary firms tend to have a deeper involvement in their company's operational and strategic activities than institutional owners. Such position of power[3] might be translated into a possibility of extracting private benefits from the company and use them for personal or family purposes, which can result in different compensation practices to those of non-family companies.

[2] Delta is the sensitivity of annual equity-based to changes in stock price and is defined along Section III.
[3] In terms of voting shares and inside knowledge.

In agreement with the above, it is central to examine how family ownership affects executive compensation policies of their firms, particularly CEOs. It is also imperative to distinguish family firms where the CEO belongs to the family since the employment of a family member for this key position is expected to have an influence on compensation levels and structure. Likewise, generational issues may impact remuneration practices[4] but this debate is beyond the scope of the research herein due to limitations on gathering enough information.

Notwithstanding the fact that these various managerial features do not have the same effect, it is reasonable to deduct a reflection of such relevant factors in executive compensation. Recent studies of both executive compensation and family businesses have been less attempted to analyse and understand the impacts of family control incentives[5] within CEOs compensation.

The primary aim of this study is to develop an empirical approach to better understanding how family representation affects CEO compensation and provide fresh and deeper insights to such a broad academic theme. Studying compensation policies in family business is important as it allows drawing inferences over agency costs theory and better understanding of CEO motivations towards maximizing firm performance.

Main results do not confirm that family firms which employ an active executive family member show a clear preference for cash-pay which indicates a possible expropriation problem. Moreover, total compensation in family-controlled firms is not significantly different as well as they do not show a lower propensity to use equity-based compensation than widely held companies. Notwithstanding, when analysing a particular case of family-controlled business that replaces its CEO, conclusions attained may suggest that that family-

[4] As descendants might view compensation practices in a different way (Villalonga & Amit, 2006).
[5] Family control incentives are perceived as the different incentives one family CEO receives for being in control of his own company or the family company that may lead to different compensation packages.

controlled firms have to pay nonfamily CEOs more to incentive them to perform at the same level that a family CEO would do.

The paper continue as follows: Section II presents a review of relevant literature regarding executive compensation under family firms and develops the hypothesis to be tested; In Section III, data, sample and methodology is described; Section IV explains the main results obtained from the regression analysis; Section V examines the evolution of Tellabs executive compensation package to analyse the changes around CEO replacements; and Section VI discuss the main conclusions and point out to future research.

## Section II - Literature Review & Hypothesis Development

Executive compensation is one of the broadest domains covered by corporate governance studies and is described as one of the solutions to mitigate the principal-agent conflict (Holmstrom, 1979). The latter conflicts arise when the shareholders and managers pursue different goals and the shareholders find it challenging or costly to monitor the performance of the managers (McConaughy, 2000) in order to reach their intended goals. The costs arising from such disputes can be mitigated by introducing compensation mechanisms to re-align the interests of managers with those of the shareholders. Many academics have tried to model compensation to produce optimal contracts that work in practice. Notwithstanding, a consensus is yet to be reached. The modern literature on the problem dates back as far as Berle & Means (1932), then built upon by Jensen & Meckling (1976), Fama (1980), and Fama & Jensen (1983) to make notable contributions in providing explanatory frameworks for this important management cost. The most agreeable solution found was to offer CEOs enough cash compensation to keep them from seeking employment elsewhere (Fama, 1980), combined with very high levels of stock-based compensation that co-aligns their decision making with shareholders' long-term interests (Jensen & Murphy, 1990 a). Nonetheless, in companies with large shareholder bases, namely like family owned businesses, this may not necessarily be the case.

The potential benefits associated with the presence of a majority shareholder were first studied by Berle & Means (1932). The authors concluded that a concentration of ownership creates considerable incentives to control management due to the vested interest that is a large proportion of their wealth invested in the company. However, studies carried out by Demsetz (1983) or Himmelberg et al. (1999) claim that ownership concentration does not significantly influence firm performance. Since companies differ in many aspects,

shareholders should choose the form of ownership that better mitigates their particular agency costs and co-aligns their interests.

It is commonly presumed that companies with a large majority shareholder can have lower, or at least not aggravated, classic agency problems, resulting in reduced agency costs. On the other hand, this type of ownership structure can raise a new issue, the extraction of private benefits. The potential upside of having a large shareholder might be overlapped by decisions that foster personal profit and disregard, or even jeopardize the company performance. Despite being extremely difficult to quantify, Grossman & Hart (1980) research conclude that expropriation of private benefits is a problem that should be taking into consideration by the large majority shareholders. Nonetheless, for family controlled firms, the expropriation effect should be evaluated taking into account stewardship behaviours. As reported by Davis et al. (1997), family members might take advantage from other non-financial benefits, which can result in reduced incentives to expropriate private benefits.

From a theoretical point of view, the predominant family effect on executive compensation is still not clear. Depending on the characteristics of the organization both can have significant impact on the structure and level of compensation of its executives. Close monitoring by shareholders will result in better alignment of interests with managers, leading to the possibility of lower remuneration levels or less use of incentive-based components. Conversely, the extraction of private benefits can result in either higher non-variable compensation or a greater percentage of performance-based components in total compensation.

## Section II.I - Ownership structure and CEO compensation

Dispersion between shareholders and managers is a primary cause of agency problems. Murphy (1999) studied dispersed ownership across U.S. firms and concluded that managers have enough discretion to pursue their own goals which may lead to several compensation distortions such as excessive pay levels or low levels of performance-based remuneration. Following this argument, Tosi et al. (2000) found evidence of disciplinary effects of concentrated ownership over executive compensation.

Gomez-Mejia et al. (1987) were among the first to analyse executive compensation in U.S. publicly listed companies. Despite compensation levels being quite similar, the authors find that compensation packages offered by such firms are generally more linked to firm performance. This evidence support the idea that a major shareholder has higher willingness to offer incentives that align management interests through better monitoring and compensation mechanisms. In line with this result, Shleifer & Vishny (1986) show that the presence of large shareholders leads to better management monitoring and reduces managerial discretion.

It is therefore expected that increased monitoring also affects a CEO ability to influence the executive compensation package. A number of studies including Hambrick & Finkelstein (1995), Core et al. (1999) and Cyert et al. (2006) report that concentrated ownership have a dampening effect on executive compensation levels. Hartzell & Starks (2003) go even further and extend a negative relation with institutional ownership. However, the evidences found can always be argued over the previous premise: shareholders should choose the form of ownership that better mitigates their specific agency costs.

## Section II.II - Family control and CEO compensation

Evidence from across the globe has shown family organizations as the dominant form of business which turns family ownership and control into a particular interesting topic in corporate governance fields. When analysing these, Jensen & Meckling (1976) defend that such businesses are sheltered from agency costs based on the premise that ownership and management overlap. Nevertheless, most recent literature argues the presence of agency problems in family businesses (Schulze et al., 2001 or Chrisman et al., 2007). Since such costs tend to be lower in family firms than in non-family ones (Chrisman et al., 2004), there is already a hint that compensation levels and components might be different for both types of businesses.

At first sight, it is possible to understand why the family form of business it is not necessarily the less effective organizational structure (Anderson & Reeb, 2003). Bertrand & Schoar (2006) indicate that family CEOs have different incentives for managing their companies. Wright & Kellermanns (2011) analyse the monitoring and disciplinary costs arising from such form of businesses and conclude that they are in fact very low. Combined with increased attitudes of stewardship, which widen investment time horizons and improve firm performance, Anderson & Reeb (2003) suggest that family businesses may not have the less effective organizational governance than non-family ones. Conversely, the downside of family ownership must equally be taken into consideration. Value destroying behaviours could emerge from actions of irresponsible leadership, expropriation from minority shareholders, hubris[6], and excessive risk-taking. Villalonga & Amit (2006) defend that the shift in agency problems from concerns between shareholders and management (principal-agent) to potential issues between the family and other shareholders (principal-principal) provides a foundation for understanding the impact of family representation in public firms.

[6] Overestimation of an individual´s own competence, accomplishments or capabilities, especially when the person exhibiting it is in a position of power.

Notwithstanding, we can have family firms which are not directly controlled by the family, i.e., they have a non-family CEO (McConaughy, 2000).

McConaughy (2000) examines compensation in family controlled firms by comparing a family CEOs against non-family CEOs. The evidence suggests that family CEOs receive lower total remuneration and less performance-based compensation. The author also concludes that family businesses have to pay more to attract good external managers. Gomez-Mejia et al. (2003) validate such hypothesis by studying total compensation inside family organizations and comparing results between family and non-family CEOs. Conclusions attained dictate lower total compensation values for family member CEOs with the difference in the correlation further growing as family ownership share increases. Consistent with such results is Combs et al. (2010) research which also defend that compensation of family CEOs is dependent on the number of active family members within the company. Their research establishes that compensation for family firms with one active family member increases by 56% in relation to other companies. However, if multiple family members are active, compensation decreases by 13%. This indicates that family members control and monitor their executives' remuneration.

In contrast, there are also additional family-CEO characteristic behaviours that can generate opposite incentives. An executive position comes with great amount of discretion, especially when involving voting rights within the company. It is then more complex for the board to effectively control CEOs who have more freedom to follow their instincts and impulses. Faccio et al. (2001), Schulze et al. (2001) and Morck & Yeung (2003) studied the relation between voting power inside family firms and claims that CEOs with a higher share of the votes have higher probabilities of abusing their power either by extracting resources from the company or by hiring colleagues or relatives. Moreover, poor stewardship may also be a concern. Finkelstein & Hambrick (1996) discuss how CEOs who also own their business have a higher tendency to become too emotionally attached to their business and start

pursuing personal ambitions in lieu of company goals. Consequences associated with such behaviours normally leads to a higher likelihood of risk-taking that can easily lead to strategic stagnation or even losses (Block, 2009).

If the CEO belongs to the controlling family, one may obtain more than financial benefits such as family status, community recognition or even provide employment for other family members and friends. Davis & Taguiri (1989), Stafford et al. (1999) and Olson et al. (2003) state that family CEOs aim to achieve a combination of financial and non-financial goals that can differ from what is normally assumed. The pursuit of non-financial objectives can be translated into stewardship behaviours, one of the most relevant incentives associated with owner management. Davis et al. (1997) show that stewardship incentives for leading and elevate the family name, fortune and reputation that characterize family CEOs by having long-run oriented management techniques and superior commitment to do what is needed to make strengthen the business.

Stewardship, in opposition to agency costs which imply that individuals in higher hierarchical positions will exploit it to enrich themselves, considers the altruistic side of executive decisions. Davis et al. (1997) suggest that individuals do not always entirely follow their own self-interests, also being motivated by altruism, generosity or loyalty. As Arregle et al. (2007) highlight, families do care more about their companies than non-family employers managing companies for third parties. Family firms are part of family identity and patrimony, being its reputation and wealth depended on the performance of the company. Adding to this the fact that professionalism and perception of the family within its social environment are also directly linked to the business, strong incentives to behave in a way that is not purely self-centred arise (Miller & Le Breton-Miller, 2005). Based on these characteristics, family CEOs might behave as pro-organization stewards rather than purely financial oriented, paying themselves lower compensation (Gomez-Mejia et al., 2001).

The CEO tenure at family-run public traded businesses is also an important factor that might help explaining compensation differences. Miller & Le Breton-Miller (2006) presents an average tenure range between 15 and 25 years, a higher interval when compared to the 3 to 4 years of non-family controlled business. The interpretation of such differences suggests that family CEOs feel quite sheltered in their job position and perform with expectations of having a long-term placement. Jacobs (1991) defends that family leaders are usually secure enough in their position, allowing less risky short-term decisions to deliver results to the governing board. In fact, an interesting finding by Gomez-Mejia et al. (2003) argues that one of the plausible causes for lower family-CEO total compensation can be the greater importance given to prudence against business risk.

Alongside family-CEO tenures, the job security argument also relates to longer investment horizons. Laverty (1996), James (1999) and Hoopes & Miller (2006) reveal that family CEOs are more likely to dedicate a substantial part of the business investment plan in research, training and development of the best infrastructures to increase and sustain good returns over their prospectively lengthy career. Indeed, some research shows evidence that family CEOs do outspend non-family peers in R&D (Weber et al., 2003) and capital investments in plant, property and equipment (Kang, 2000). Miller & Le Breton-Miller (2006) concluded that results from stewardship behaviours, long-run investment horizon avoiding short-term management added with more R&D, training, and capital expenditure, allows family-controlled firms a better chance to develop higher long-term financial results.

Jensen & Murphy (1990b) and Sanders (2001) agree that a CEO is a central resource allocator, a decision-making player, and that shareholders boards influence CEOs to make pro-shareholder decisions through their remuneration. In line with this argument one can expect that executive compensation is likely to be a factor heavily affected by family influence. Based on these family-CEO characteristics and motivations, the family control incentive predicts that founding-family CEOs have greater incentives for maximizing firm

performance derived from their relation to the firm and the exclusive perks available to them. This would translate in less need for performance-based compensation.

Consensus is elusive within the literature available on the correlation between family ownership and compensation. Family ownership tends to have a negative relation with family CEOs compensation, favoring the notion that remuneration is less important as an incentive alignment mechanism. A family bond seems to mitigate agency costs, monitor the CEO and provides evidence of non-expropriation of minority shareholders. Nonetheless, some studies offset these findings and establish positive relations between compensation and family ownership. The explanation might be once again found in abuse of power and private benefit extraction. Either a family member is CEO and extracts private benefits in form of higher pay or outside CEOs are dominated by family members and let them expropriate minority shareholders.

Observing that only a few studies explore the distinction between family controlled firms and otherwise, it provides to this piece of research the opportunity to shed some light on this topic by analysing CEOs' compensation levels, structure and pay-to-performance sensitivity. When having a non-family CEO inside a family firm it is not accurate to assume that said individual possesses the same incentives and generates the same agency costs as if it was a family member. The majority of past family literature with regards to the impact of family control on compensation packages argues that incentives are strong enough to increase CEO monitoring. This generates expectations towards the possibility of family CEOs to receive lower total compensation when compared with non-family CEOs:

***Hypothesis 1:*** *The total compensation levels of family CEOs are less than that of nonfamily CEOs.*

In accordance to previous research on compensation structure, the intention of this research is towards demonstrating that it might also be different among family and non-family controlled firms. Block (2008) uses a Bayesian approach to analyse compensation structure inside family firms and non-family firms. The author found that family CEOs receives a higher fraction of compensation in base salary and a lower part in stock-options when compared to outside CEOs. Hypothesis two can then be described as:

***Hypothesis 2:*** *The compensation structure of family CEOs is different than that of nonfamily CEOs.*

In line with hypothesis two, Block (2008) also ascertains that pay-to-performance relation is weaker in family-managed companies despite presenting high levels. As discussed before, one benefit from having family-controlled firms is the fact that owners and management becomes only one person as the founder or a relative to the founder is, at the same time, the CEO of the company. Subject to further discussion about family firm and family-controlled firm definitions, many owner-managers have the power, incentive, and knowledge to lead the company. The subsequent reduction in free-rider agency costs derived by intrinsic motivators can generate superior incentives towards interest co-alignment. It is then expected that by introducing family control into family firms, the dispute of management and ownership interests will less probable. As family CEOs are closely tied to their firms, they would have less need for compensation-based incentives:

***Hypothesis 3:*** *The compensation of family CEOs is less sensitive to performance than that of nonfamily CEOs.*

## Section III - Data, Sample and Methodology

In this research detailed breakdown of CEO pay components data that follows recently expanded disclosure rules[7] is gathered in order to carry out a complete comparative analysis of executive compensation inside family and non-family firms. The analysis covers companies listed on the S&P 500 between fiscal year 2000 and 2010. The primary source of compensation data for U.S. CEOs is S&P´s ExecuComp database, while the accounting and market data were drew from Compustat. All companies without complete compensation and market information were excluded. In addition, all financial [8] and utility[9] firms have been removed as such firms have specific compensation characteristics that could bias the results. The omission of all companies being listed in the S&P500 index during less than three years of the total time frame used is another restriction used to reduce bias effects. Such an assumption avoids data anomalies coming from internal promotions, partial-year compensations, signing bonuses or grants conceived to outside hired CEOs. As a result, the starting sample is based on 417 companies.

Furthermore, the sample is split into family and non-family firms using the list published by BusinessWeekMagazine (2003). This publication ranks the top 100 family businesses inside the S&P 500, providing helpful qualitative information about the ownership structures and management compositions of the family firms sub-sample. Similar indices such as the Fortune 500 or the Family Business Index have been widely employed to compare family and non-family firms, for example, in terms of financial performance (e.g., Villalonga & Amit, 2006). Regarding the particular time period selection, it is intentionally considered to match the referred magazine analysis. However, since there was no information available regarding family firms in the year 2000, it is assumed that all the companies listed in such list of 2003

[7] New disclosure rules redefined certain compensation components, in particular bonuses that are now classified as non-equity compensation.
[8] Companies with standard industrial classification ("SIC") code between 6000 and 6999.
[9] Companies with SIC code between 4900 and 4999.

would be family controlled in 2000. A 10 year period is chosen with the purpose of providing enough length to perform a consistent regression analysis and draw reasonable conclusions.

In order to perform the referred data split it is crucial to define what a family business is and identify which companies match that criteria. This step constitutes one of the major concerns[10] of past studies, creating divergences among researchers. To what extend should a business be considered as family owed? Shanker & Astrachan (1996) draw attention to the difficulty of defining a family business accurately and a satisfactory definition of family firm is yet to be found (Astrachan et al., 2002).

General definitions of family businesses dictate that families should aggregate effective control of strategic direction with the intention of retaining firm ownership, with or without great direct participation. As to achieve higher research specification, the definition of family-owned firm was narrowed down to include only those in which ownership of founding family is bigger than five percent or when a member of the founding family is present on the board. Such classification is in line with the one used by Anderson & Reeb (2003) and BusinessWeekMagazine (2003) providing foundations for the sample division of this research.

Using the above definition, the final sample is established by the 80 firms identified as being family businesses. However, to analyse the full spectrum of family impact, the sample is breakdown into family controlled and non-controlled firms in which control is characterized as a family that actively impacts the management of its firm. In this study, control will be perceived as having a CEO that belongs to the founding/owning family.

[10] The concern of defining family ownership is essentially an endless process. Restrictive and inclusive definitions have been employed across literature. Among the most recent is the one provided by the European Commission in the document "Overview of Family-Business-Relevant Issues: Research, Networks, Policy Measures and Existing Studies" (November, 2009) which combines the dimension of ownership rights and presence of family members in the top management positions of the company. Most of the time family businesses definition tends to be very detailed. As far as historical studies are considered, the requirements of the definition can often hardly be met given the lack of information available about voting rights, or decision-making rights. The consequence is that different assumptions might lead to different results.

The distinction is obtained by conducting research over each company CEO track record and analyse weather it belongs or not to the founding or owning family. 216 family controlled-firms observations across the sample period are specified, allowing better inference regarding which factors are responsible for hypothetical executive compensation differences between family and non-family CEOs. Nonetheless, the referred concerns have to be taken into account when using such family definition as different assumptions might lead to different conclusions.

After defining the sample and the time period, the different components of executive compensation for each CEO are calculated: Salary, Bonus, Stock Option, Restricted Stock and Long Term Incentive Awards (LTIAs). The resultant summary statistics, represented in Table 1, includes 4,124 firm-year observations that have complete data for all components. The value of options is computed using the Black-Scholes model which uses exercise price and option term data from ExecuComp. Cash compensation is defined as the sum of salary and bonus and total compensation as the sum of all defined components. Additionally, the statistics about the proportion of total compensation that comes from each pay component are also calculated. Details about the calculation of all compensation variables are provided in Appendix.

In order to measure compensation incentives, the sensitivity of annual equity-based to changes in stock price (*Delta*) is computed following Guay (1999). *Delta_c* is measured as the change in the value of the CEO's annual equity-based compensation for a 1% change in the stock price and *Delta_t* as the sensitivity for the CEO's total portfolio of current and outstanding prior grants of shares and options[11]. To determine whether family CEOs compensation levels differ from that of non-family CEOs, this research makes use of the tests of mean differences and multidimensional panel data regression model.

[11] Core & Guay (2002) methodology was used to both computations. Also both incentive measures were winsorized only at the 99$^{th}$ percentile and not also at 1$^{st}$ percentile since these variables are truncated at zero.

Table 1 presents the summary statistics of all annual compensation variables while Table 2 illustrates the same statistics for the family controlled and non-family control division. Table 1 reports a total annual compensation average of c. $10.8 million wherein only c. $2.1 million derive from cash compensation. In dollar terms, stock options are, on average, the most significant component of compensation levels while salary is the less important one. Nevertheless, observing the median ($50^{th}$ percentile), a typical CEO simply earns c. $6.6 million but then again has options as the largest compensation component. Statistics about the breakdown of total compensation components are also provided. On average, options represent almost 40% of CEOs` total compensation, which is about the same value resultant from the median percentile.

Table 1 also shows summary statistics for CEO incentive measure, *Delta*. Throughout the 10 year average, the change in CEO annual equity-based pay (*Delta_c*) is equal to c. $122.2 thousand per 1% stock price change. Moreover, the same stock price variation implies an average change of c. 2.8 million over the full portfolio of equity holdings (*Delta_t*). Notwithstanding, when analysing the average CEO, incentives are less sensitive which represents a more realistic view over the market average of pay-to-performance sensitivity.

With the purpose of controlling for the full range of factors that influence compensation, other potential control variables are taken into consideration. These factors can be divided in variables related with company´s characteristics and those that describe CEO characteristics. The first set of factors is related to firm characteristics, empirically known to affect the level of CEO remuneration as point out by prior evidence in U.S. studies (e.g. Devers et al., 2007). On the other hand, individual CEO characteristics, which are widely employed in compensation research, are expected to be systematically different in family versus non-family businesses. Nevertheless, such features are proven to be statistically not relevant as shown by Fernandes et al. (2013). At any case, such characteristics were included in the control variables set.

**Table 1 - Summary Statistics**

Contains a summary statistics for all variables employed in the analysis over the entire sample period. The sample consists of 4,127 firm-year observations over fiscal years 2000 through 2010 and all the variables are described along Section III and on the Appendix. Control variables have a slightly reduced sample size as both firm specific and individual CEO characteristics are not available for some of the compensation data.

| Variable | *N* | Mean | Standard Deviation | 25th Percentile | 50th Percentile | 75th Percentile |
|---|---|---|---|---|---|---|
| **Level of CEO compensation (thousands of dollars)** | | | | | | |
| Salary | 4,127 | 996.094 | 516.461 | 750.000 | 964.000 | 1,155.000 |
| Bonus | 4,127 | 1,028.117 | 2,410.587 | 0.0 | 370.337 | 1,363.500 |
| Stock Option | 4,127 | 5,089.121 | 13,765.712 | 357.676 | 2,321.257 | 5,499.796 |
| Restricted Stock | 4,127 | 2,117.217 | 4,183.420 | 0.0 | 16.120 | 2,901.600 |
| LTIAs | 4,127 | 1,493.400 | 10,299.316 | 0.0 | 0.0 | 0.0 |
| Total Compensation | 4,127 | 10,759.984 | 18,228.674 | 3,677.013 | 6,554.694 | 11,791.555 |
| Cash Compensation | 4,127 | 2,060.246 | 2,591.975 | 991.800 | 1,445.625 | 2,425.000 |
| **Percentage of CEO compensation** | | | | | | |
| *P_Salary* | 4,124 | 0.213 | 0.219 | 0.088 | 0.144 | 0.238 |
| *P_Bonus* | 4,124 | 0.126 | 0.172 | 0.0 | 0.062 | 0.196 |
| *P_Option* | 4,124 | 0.394 | 0.306 | 0.080 | 0.389 | 0.642 |
| *P_RS* | 4,124 | 0.210 | 0.274 | 0.0 | 0.005 | 0.387 |
| *P_LTIAs* | 4,124 | 0.056 | 0.158 | 0.0 | 0.0 | 0.0 |
| **Delta (thousands of dollars)** | | | | | | |
| *Delta_c* | 4,127 | 122.235 | 217.152 | 32.006 | 70.369 | 137.304 |
| *Delta_t* | 4,127 | 2,780.874 | 14,581.931 | 314.026 | 648.728 | 1,426.597 |
| **Other Variables** | | | | | | |
| *Sales (billions of dollars)* | 4,127 | 8.780 | 1.270 | 7.868 | 8.714 | 9.611 |
| *Leverage (%)* | 4,103 | 0.232 | 0.169 | 0.113 | 0.220 | 0.323 |
| *ROA (%)* | 4,121 | 0.156 | 0.089 | 0.103 | 0.151 | 0.201 |
| *Shareholder Return (%)* | 4,061 | 10.055 | 39.763 | 0.299 | 1.801 | 6.360 |
| *Stock Return Volatility (%)* | 4,127 | 0.384 | 0.200 | 0.248 | 0.334 | 0.457 |
| *Gender* | 4,127 | 0.981 | 0.138 | 1 | 1 | 1 |
| *Tenure* | 4,078 | 6.898 | 6.188 | 3 | 5 | 9 |
| *Age* | 4,117 | 55.382 | 6.862 | 51 | 56 | 60 |

The natural logarithm of sales in billions of dollars corresponds to the firm size parameter. As standard practice, the logarithmic form of the variable *Sales* is used to reduce heteroscedasticity (Gomez-Mejia et al., 2003). Murphy (1999) observes a significant positive relation between firm size and compensation. The increase of businesses size in recent years is pointed out by Tosi et al. (2000) as the main driver of contemporaneous CEO compensation increases.

Regarding industry effects, Westhead & Crowling (1998) defend that family firms are over-represented in some industries and that such characteristics may expose CEO compensation to industry patterns. Consistent with Anderson & Reeb (2004) prior research, SIC code dummy variables were used to control for industry effects. Also, year dummy variables were used to control for effects that may relate to specific events of the sample (year effects).

Generally, companies with high leverage situations have higher likelihood of go into financial distress. However, the effect of such control variable remains uncertain. In one hand, Madura et al. (1996) defend a positive relation arguing that higher probability of distress is linked to higher risk which in turn leads to an increase in CEO remuneration to compensate for the additional risk. On the other hand, John (1993) found that equity-based remuneration has a negative relation to leverage as a consequence of agency costs of debt[12]. The leverage variable formula employed is book value of long term plus current debt divided by total assets.

For firm performance measures, return on assets ("ROA") is selected as an accounting performance indicator while *Shareholder Returns* is for controlling market-based performance. ROA is defined as net income divided by total assets and shareholder returns is measured as the change in stock price over the year plus dividends paid, divided by the stock

[12] The agency cost of debt arises due to different interests between shareholders and debt-holders.

price at the start of the year (Combs et al., 2009). Jensen & Murphy (1990 a, 1990 b) defend that compensation should be closely dependent on performance. The monetary incentive positive relation goes in line with the interest alignment mechanism discussed before.

As discussed before, the level of risk has also an impact over compensation. However, it is not clear whether it is positively or negatively. Empirically, Core et al. (1999) find a negative relation supported by their results of decreasing CEO pay-performance sensitivity when risk increases. In opposition, Linck et al. (2009) defend the opposite, arguing that riskier companies are offering more equity-based compensation to managers as to mitigate agency theory costs. Therefore, Core et al. (1999) methodology was used which employs *Stock Return Volatility* as annualized standard deviation of daily stock return, which capture the riskiness of the company.

CEO characteristics were also considered due to the possibility of influencing compensation packages. Lippert and Moore (1994) defend that as CEO get older, they are less affected by labour market pressures, increasing the importance of rewarding such CEO with higher equity-based incentives. Conversely, Gray & Cannella (1997) conclude that older CEOs have higher risk-averse sentiments. The effect results in lower risk strategies which lead to lower needs of equity-based incentives to mitigate such agency cost. The CEO age is then use to account for such effects. Additionally, CEO gender is also believed to have an impact over executive's compensation as reported by Gomez-Mejia et al. (2003). Notwithstanding, in this sample there is only two women included (in the non-family sample), which will certainly not be enough to provide any conclusions. Nevertheless a dummy for gender was created which has value of 1 for male CEOs and 0 for women CEOs.

**Table 2 - Summary Statistics**

Include the summary statistics for the same variables as in Table 1 but introducing the family versus non-family control differentiation. The sample consists of 216 firm-year observations over years 2000 through 2010 for the family control sample and 3,911 firm-year observations over the same period for the non-family control sample. Control variables have a slightly reduced sample size as both firm specific and individual CEO characteristics are not available for some of the compensation data. Family Control is defined as having a family-member as a CEO.

| | Family Control | | | Non-family Control | | |
|---|---|---|---|---|---|---|
| **Variable** | ***N*** | **Mean** | **Median** | ***N*** | **Mean** | **Median** |
| **Level of CEO compensation (thousands of dollars)** | | | | | | |
| Salary | 216 | 759.762 | 748.375 | 3,911 | 1,009.147 | 974.365 |
| Bonus | 216 | 855.500 | 400.000 | 3,911 | 1,037.650 | 367.500 |
| Stock Option | 216 | 11,100.218 | 2,450.271 | 3,911 | 4,757.135 | 2,320.316 |
| Restricted Stock | 216 | 921.341 | 0.0 | 3,911 | 2,183.264 | 196.346 |
| LTIAs | 216 | 226.234 | 0.0 | 3,911 | 1,563.384 | 0.0 |
| Total Compensation | 216 | 13,869.276 | 5,137.511 | 3,911 | 10,588.262 | 6,589.321 |
| Cash Compensation | 216 | 1,621.483 | 1,261.599 | 3,911 | 2,084.479 | 1,462.500 |
| **Percentage of CEO compensation** | | | | | | |
| *P_Salary (%)* | 213 | 0.228 | 0.129 | 3,911 | 0.212 | 0.145 |
| *P_Bonus (%)* | 213 | 0.125 | 0.066 | 3,911 | 0.126 | 0.062 |
| *P_Option (%)* | 213 | 0.504 | 0.524 | 3,911 | 0.388 | 0.381 |
| *P_RS (%)* | 213 | 0.121 | 0.0 | 3,911 | 0.215 | 0.031 |
| *P_LTIAs (%)* | 213 | 0.022 | 0.0 | 3,911 | 0.058 | 0.0 |
| **Delta (thousands of dollars)** | | | | | | |
| *Delta_c* | 216 | 173.744 | 61.052 | 3,911 | 119.391 | 70.667 |
| *Delta_t* | 216 | 18,663.919 | 2,768.062 | 3,911 | 1,903.672 | 612.748 |
| **Other Variables** | | | | | | |
| *Sales (billions of dollars)* | 216 | 8.555 | 8.292 | 3,911 | 8.793 | 8.725 |
| *Leverage (%)* | 212 | 0.116 | 0.086 | 3,891 | 0.238 | 0.226 |
| *ROA (%)* | 213 | 0.182 | 0.183 | 3,908 | 0.154 | 0.150 |
| *Shareholder Return (%)* | 214 | 2.419 | 0.997 | 3,847 | 10.480 | 1.859 |
| *Stock Return Volatility (%)* | 216 | 0.436 | 0.377 | 3,911 | 0.381 | 0.332 |
| *Gender* | 216 | 1 | 1 | 3,911 | 0.980 | 1 |
| *Tenure* | 208 | 15 | 14 | 3,870 | 6.5 | 5 |
| *Age* | 216 | 56.5 | 58 | 3,901 | 55 | 56 |

The length of a CEO mandate has also divide the literature which point towards a combination of conclusions. Higher salaries may be explained by executive's tenure and not by CEOs family connections. McConaughy (2000) follows the argument that considers age as a measure of CEOs` experience. The more experience a CEO has, the higher the likelihood of getting his salary raised. On the contrary, longer tenures are also associated with managerial entrenchment. As Hill & Phan (1991) conclude, the longer an executive has been on the job the better he knows how to influence the board and extract private benefits. Such a relation is even more important inside family firms as family members will be more indisposed to leave his job to an outsider. CEO *Tenure* is used to control for such effects and is defined as number of years a CEO has held his position in the firm.

Furthermore, a dummy variable was created to control for differences in ownership and control. The dummy takes the value of one if a company has ownership and control performed by a family. This differential is the base line of the hypothesis tests to be performed over Section IV and aims to find enclosure over CEO compensation levels, structure and sensitivity in family controlled and non-family controlled.

Table 2 indicates that family controlled companies pay, on average, more to their CEOs than non-family firms. Total compensation for family member CEOs is c. $13.9 million in contrast to c. $10.6 million of non-family CEO. Contrariwise, when analysing the typical CEO, total compensation is higher for non-family CEOs, which meets the first hypothesis test. Stock options remain the largest component for both CEO types, representing around 50% for family CEOs and about 40% for non-family CEOs. Regarding compensation incentives, family CEOs have slightly higher sensitivity over current equity portfolio whereas the same is not applicable for the full equity holdings sensitivity.

However these interpretations do not control for industry and firm size, recognized to be the most important determinants of the level of executive compensation (Jensen & Murphy, 1988 and Murphy, 1999). Such control variables will then be employed in the empirical tests to allow the determination of clearer effects on CEO compensation. The lack of controlling is probably going to result in unreliable tests of means as the variables may be systematic related. Testing the difference of means between the two samples represents a simple and suitable univariate analysis for descriptive purposes. Table 3 reports the mean differences between family and non-family control sub samples for compensation, sensitivities and control variables, alongside with respective t-statistics significance test.

As shown in the Table 3, all differences are statistically significantly besides Bonus. Family CEOs have significant lower salary, restricted stock and cash compensation than the non-family ones. Nonetheless, the relation is inverted with regards to stock options and total compensation, where family CEOs earn substantially more.

Concerning the size of the company, it seems like both natures of CEOs perform in similar average sized family companies. Notwithstanding, family controlled firms are, on average, less leveraged and reward less their shareholders. Such finding supports the argument of family businesses having less leverage due to higher efforts on relying their financial strength by building up equity instead of using debt. Such companies also outperform on average non-family controlled firms in terms of ROA despite higher average stock volatilities.

In terms of CEO characteristics, family CEOs tend to be slightly older (56 against 55 years for non-family CEOs) and seems to stay longer at the leading position of the company (15 against 6.5 years for non-family CEOs). The difference of approximately 9 years reflects family CEOs higher probability of been rose when compared to external hired CEOs.

**Table 3- Test of Mean Differences**

Reports averages for the control variables in controlled and non-controlled family firms, along with the t-statistic testing the difference in means between the two samples. Variables are defined in Section III. The table reports t-statistics based on robust standard errors clustered at the industry level in parentheses. *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

| Variable | Family Control Mean | Non-family Control Mean | Difference | |
|---|---|---|---|---|
| **Level of CEO compensation (thousands of dollars)** | | | | |
| Salary | 759.762 | 1,009.147 | 249.385 | *** |
| Bonus | 855.500 | 1,037.650 | 182.150 | |
| Stock Option | 11,100.218 | 4,757.135 | -6,343.100 | *** |
| Restricted Stock | 921.341 | 2,183.264 | 1261.92 | *** |
| LTIAs | 226.234 | 1,563.384 | 1337.15 | * |
| Total Compensation | 13,869.276 | 10,588.262 | -3,281.000 | *** |
| Cash Compensation | 1,621.483 | 2,084.479 | 462.996 | ** |
| **Delta (thousands of dollars)** | | | | |
| *Delta_c* | 173.744 | 119.391 | -54.353 | *** |
| *Delta_t* | 18,663.919 | 1,903.672 | -16,760.000 | *** |
| **Other Variables** | | | | |
| *Sales (billions of dollars)* | 8.555 | 8.793 | 0.238 | *** |
| *Leverage (%)* | 0.116 | 0.238 | 0.122 | *** |
| *ROA (%)* | 0.182 | 0.154 | -0.028 | *** |
| *Shareholder Return (%)* | 2.419 | 10.480 | 8.061 | *** |
| *Stock Return Volatility (%)* | 0.436 | 0.381 | -0.055 | *** |
| *Tenure* | 15.255 | 6.449 | -8.806 | *** |
| *Age* | 56.519 | 55.319 | -1.200 | ** |

# Section IV - Empirical Approach and Results

In agreement with previous data set employed, this section describes the general multidimensional panel data regression model used to measure the relation between executive compensation packages and founding family control and present the main results. The first sub-section analyse the first two hypotheses and the second sub-section the remaining one. To begin with, empirically demonstration that family-controlled firms offer lower total compensation to their CEOs` in comparison to non-family controlled firms will be performed. Therefore, an OLS regression to estimate total compensation after controlling for year, industry effects and firm and CEO characteristics was employed:

$$\begin{aligned} Ln(Total\ Compensation) \\ &= \alpha\ + \beta_0(Family\ control\ dummy) + \beta_1(Control\ variables_i) \\ &+\ \beta_2(Industry\ dummies) + \beta_3(Year\ dummies) + \varepsilon_i \end{aligned} \quad \textbf{(1)}$$

The main variable of interest is "*Family_Control*", which evaluates the differential of compensation of family-controlled executives over those from non-family controlled companies. The OLS regression includes firm fixed effects to control for any unobserved time-invariant heterogeneity across firms[13]. The inclusion of fixed effects in the regressions allows the identification of firm changes within dependent variables average as a function of the independent variables. In addition, standard errors are clustered at the industry-level to take into account the fact that residuals may not be independent within industries.

Furthermore, the structure of such compensation packages will be analysed to test the second hypothesis. For this analysis it was employed the same regression as presented in

[13] The simple OLS regressions (without firm fixed effects) are provided in the Appendix (Table A1).

Equation (1), using each compensation component as percentage of total compensation as depend variable: Salary, Bonus, Options, Restricted Stock (RS) and LTIAs.

For the third hypothesis, pay-to-performance sensitivity is evaluated by employing the incentive measures in place of the compensation components as depended variables.

**Section IV.I - Family CEOs compensation structure**

At first, family control feature is considered as to understand to what extension the total compensation and its various components will differ when comparing it against non-family controlled businesses. In Table 4, regression of the natural logarithm of total compensation as well as the fraction of total pay components corresponding to each of the five pay components is presented. The regression also includes all discussed control variables and firm fixed effects.

The unpredictable conclusion is that family control does not influence executive compensation, contradicting previous family executive compensation literature. Despite family control expectations of negative relation with total compensation, statistical evidence was not found on this research. Moreover, neither cash nor stock options differ between family CEOs versus non-family CEOs inside family business universe.

Even though null results need to be interpreted with caution, these non-significant findings are still important. For example, on a sample of multi-family member firms, Gomez-Mejia et al. (2003) found that the difference between family and non-family CEOs is caused by lower-than-average pay among family CEOs and not from non-family CEOs requirement of higher-than-average premium pay. The authors argued that it is the number of family members in the board that causes such difference.

**Table 4 - Firm fixed effect regressions describing changes in the structure of CEO compensation between family and non-family controlled firms.**

The sample consists of 3,985 firm-year observations over the 10 year period of 2000 to 2010. *Log_Total_Comp* is the logarithm of the dollar value of total compensation (including salary, bonus, stock option, restricted stock, and LTIA and in units of thousands of dollars) for each CEO. *P_Salary*, *P_Bonus*, *P_Option*, *P_RS*, and *P_LTIAs* are the fractions of total compensation coming from those individual components of pay. The independent variables in the regressions include an indicator (*Family_Control*) equal to one for the family-controlled firms (which is defined as having a family-member as a CEO) and zero otherwise and other control variables that include firm and individual characteristics. Variables are defined in Section III. The table reports *t*-statistics based on robust standard errors clustered at the industry level in parentheses. *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Variables** | ***Log_Total_Comp*** | ***P_Salary*** | ***P_Bonus*** | ***P_Option*** | ***P_RS*** | ***P_LTIAs*** |
| **Family_Control** | -0.328 | 0.007 | 0.001 | -0.008 | -0.000 | -0.000 |
| | (0.396) | (0.079) | (0.034) | (0.077) | (0.043) | (0.015) |
| **Log_Sales** | 0.226** | -0.020 | 0.013 | 0.035* | -0.045** | 0.016 |
| | (0.101) | (0.016) | (0.013) | (0.020) | (0.018) | (0.011) |
| **ROA** | 0.732* | -0.218*** | 0.160** | 0.078 | 0.099 | -0.119*** |
| | (0.442) | (0.064) | (0.074) | (0.096) | (0.081) | (0.043) |
| **Shareholder_Return** | -0.002*** | 0.000 | -0.000 | -0.000* | 0.000 | -0.000 |
| | (0.001) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| **Leverage** | -0.747** | 0.066 | 0.001 | -0.173*** | 0.040 | 0.066** |
| | (0.315) | (0.050) | (0.031) | (0.053) | (0.047) | (0.027) |
| **Volatility** | 0.153 | 0.005 | -0.027 | 0.371*** | -0.244*** | -0.105*** |
| | (0.182) | (0.037) | (0.024) | (0.049) | (0.042) | (0.028) |
| **Tenure** | -0.005 | 0.004** | 0.001 | -0.003 | -0.003* | 0.001 |
| | (0.007) | (0.002) | (0.001) | (0.002) | (0.002) | (0.001) |
| **Age** | -0.003 | 0.001 | 0.001 | -0.000 | 0.001 | -0.002** |
| | (0.007) | (0.001) | (0.001) | (0.002) | (0.001) | (0.001) |
| **Gender** | 0.109 | -0.002 | -0.040 | -0.010 | 0.001 | 0.051 |
| | (0.233) | (0.038) | (0.042) | (0.056) | (0.067) | (0.068) |
| **Observations** | 3,985 | 3,985 | 3,985 | 3,985 | 3,985 | 3,985 |
| **R-squared** | 0.054 | 0.060 | 0.219 | 0.172 | 0.363 | 0.103 |
| **Number of id** | 414 | 414 | 414 | 414 | 414 | 414 |

This argument implies that strategic control family board members exert on family CEOs does not extend to non-family-member CEOs. Notwithstanding, the number of family members in the company board has not been included has variable due to information limitations, namely time and data availability constrains. As a consequence, empirical results of the present study do not walk in lockstep with past literature findings mainly due to the lack of important control variables that generate biased statistics. Nevertheless, interpretation of all significant variables will be undertaken. Likewise, further discussion regarding the model limitations and future research opportunities will be provided on Section VI.

Regarding control variables, there are some results consistent with prior theory and other effects that do not follow previous expectations. The interpretation metric used to analyse Table 4 is 1% change in the dependent variable will have $\beta$% change in the independent variable, ceteris paribus, for all firm characteristics. For age and CEO tenure, the change in dependent variable is in years.

The first set of controls, with regards to firm characteristics, present some assorted results. Company size has statistically significant relation with total compensation, impacting 22.6%, and options, 3.5%. Such results go in accordance with Murphy (1999) findings of significant positive relation between firm size and compensation. Conversely, restricted stock is negatively related with the size of the firm with -4.5%.

As proposed by Jensen & Murphy (1990a, 1990b), firm performance variables should be relevant factors of compensation. In the estimated regressions, ROA has significant positive relation with bonus and total compensation. Despite lower significance level, ROA impacts 73.2% of total compensation and 16% of bonus component. On the contrary, the negative strong effect produced on salary constituent, -21.8%, and on LTIAs, -11.9%, is challenging previous literature. Shareholder returns also produce a strong negative impact over total

compensation and options, however, the effect has no real expression (-0.2% and 0%, respectively).

Regarding volatility effects, a significant impact over options (37.1%), restricted stock (-24.4%) and LTIAs (-10.5%) is observable. As reviewed before, risk levels have no clear empirical expectation regarding executives compensation. Options follow Linck et al. (2009) findings which expect family businesses to offer more option compensation to their CEOs in order to mitigate the risk associated with higher volatile management. Restricted stock and LTIAs results follow Core et al. (1999) conclusions of decreasing CEO equity-based compensation when risk levels increase.

As pointed out early in this study, CEO individual characteristics variables seem to either have no statistical significance or, when they do, the magnitude of the effect is residual. According with that, tenure has slightly positive effect of 0.4% only over salary and CEO age has a negative effect of 0.3% only over LTIAs.

Accounting for all results and respective analysis, hypothesis 1 and 2 are not corroborated. Hypothesis 1 predicted that family-member CEOs receive less total compensation than CEOs of non-family. However, such argument is not supported by statistical evidence as deduct over the analysis. Despite having the expected effect, family control dummy variable is not statistically significant to explain total compensation levels.

Moreover, hypothesis 2, which predicted that family-member CEOs have different compensation structure, is also not corroborated. Expectations from previous literature support the perception of family controlled firms using different compensation structures, especially regarding equity-based incentives. Notwithstanding, as referred in the analysis, not

only family control dummy variable shows effects very close to null but also demonstrates that such effects are statistically insignificant[14].

**Section IV.II - Family CEOs pay-to-performance sensitivity**

Table 5 presents the results of regressions using the incentive measures, in place of the compensation components, as dependent variable. Following Guay (1999), the regressions include the family control dummy, firm fixed effects and discussed control variables. Incentives for current compensation grants and outstanding portfolio of both current and past grants of shares and options are examined. Despite the fact that incentives are provided by both current and total grants of shares and options, the concern is on how CEO compensation changes with regards to family control. Subsequently, current grants represent the proportion of outstanding compensation that is directly under control of the boards of directors which better represent current trends of compensation packages.

First column of Table 5 presents the sensitivity of current average CEO compensation to changes in firm value (*Delta_c*). The coefficient estimated on the firm control variable is negative and is not statistically significant. Notwithstanding the fact that such result provides a coefficient magnitude that confirms the argument of family controlled firms providing lower performance-based pay, statistic results indicate that family-control effect is not relevant when analysing pay-to-performance sensitivity.

[14] A sample split was also employed to control for temporary remuneration changes associated with 2007-2009 global financial crises (2000 to 2006 and 2007 to 2010). Results attained show positive statistically significant relation between family control and total salary for the latter sub-period. With regards to options, a negative statistically significant relation with family control was observed. Results are available upon request.

**Table 5 - Firm fixed effect regressions describing changes in CEOs incentive measure (Delta) between family and non-family controlled firms.**

The sample consists of 3,988 firm-year observations over the 10 year period of 2000 to 2010. The dependent variables in the regressions are sensitivities of current (*Delta_c*) and total (*Delta_t*) annual equity-based compensation to changes in stock price. The independent variables mainly follow Guay (1999). Both variables are defined along Section III. The table reports *t*-statistics based on robust standard errors clustered at the industry level in parentheses. *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

| | (1) | (2) |
|---|---|---|
| **Variables** | *Delta_c* | *Delta_t* |
| **Family_Control** | -20.984 | 5,456.080* |
| | (37.264) | (2,959.917) |
| **Log_Sales** | 37.161*** | 769.173** |
| | (13.599) | (299.667) |
| **ROA** | -37.740 | 2,981.201*** |
| | (73.083) | (1,140.967) |
| **Shareholder_Return** | -0.530*** | -6.730*** |
| | (0.140) | (2.285) |
| **Leverage** | -45.943 | -1,489.510 |
| | (39.374) | (1,831.887) |
| **Volatility** | -36.689 | 264.325 |
| | (29.182) | (495.063) |
| **Tenure** | 0.434 | 173.326*** |
| | (1.142) | (52.525) |
| **Age** | -0.226 | -32.776 |
| | (0.930) | (37.040) |
| **Gender** | 52.077 | 225.118 |
| | (66.396) | (380.330) |
| **Cash_Compensation** | 0.004** | -0.034 |
| | (0.002) | (0.036) |
| Observations | 3,988 | 3,988 |
| R-squared | 0.034 | 0.156 |
| Number of id | 414 | 414 |

The second column offers calculations using the sensitivity of the CEOs full portfolio of current and prior grants of shares and options (*Delta_t*) as dependent variable. In contrast to the results for the current delta, overall pay-to-performance sensitivity appears to have a weak positive relation with family control variable. With a coefficient significance of 10%, equity holdings of family CEOs appear to be, on average, around $5.5 million more sensitive to a 1% stock price change than non-family CEO running family firms. Nevertheless, the magnitude of the effect indicates a major concentration of CEOs full portfolio sensitivity on the distribution right tail (also verifiable by comparing *Delta_t* mean and median on Table 1) which can bias the results.

Consistent with Core & Guay (1999) argument of larger firms providing greater dollar incentives, both Deltas increase with firm size. Surprisingly, ROA have positive effects on CEOs´ total portfolio sensitivity. Taking into account that the magnitude of the effect is quite expressive, it is believed that such a disruptive result may be a cause of *Delta_t* distribution shape. On the other hand, shareholder return effect follows an expected negative relation with pay-to-performance sensitivity measures. As shareholders receive higher returns from their investments, they will be more pleased with CEOs performance and less concerned about disciplinary control mechanisms. This will result in less remuneration based on performance. Total Portfolio pay-to-performance sensitivity is also positively related to CEO tenure. Moreover, cash compensation is also statistically significant to explain the sensitivity of current average CEO compensation to changes in firm value. However the magnitude of such effect is residual.

With regards to hypothesis 3, concluding remarks are ambiguous. There is no empirical evidence that performance-based compensation is influenced by family control. Despite lower significance on the sensitivity of total equity-based portfolio, the results were exactly

the opposite of what was expected[15]. In other words, hypothesis 3 is also not corroborated by main findings of this research.

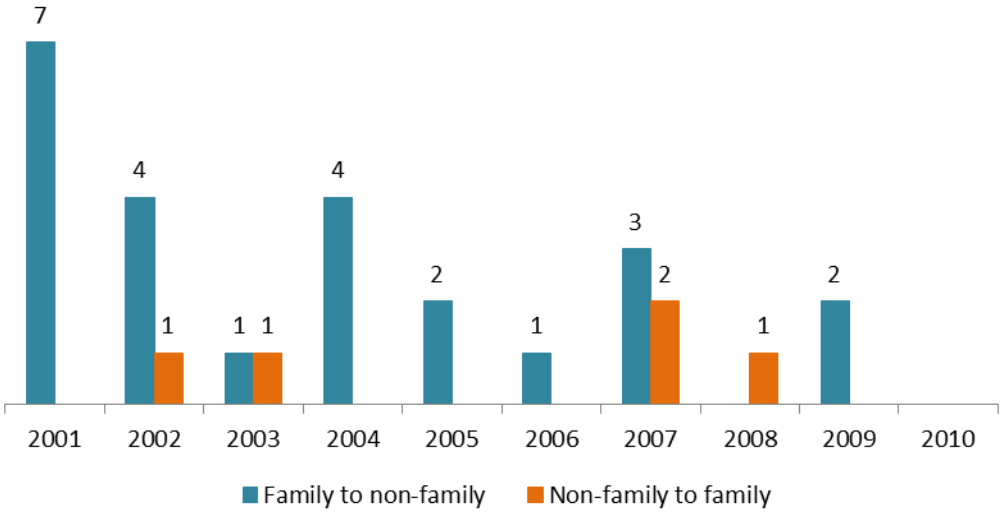
[15] A sample split was also employed to control for temporary remuneration changes associated with 2007-2009 global financial crises (2000 to 2006 and 2007 to 2010). Results attained show positive statistically significant relation between family control and current delta for the latter sub-period. Results are available upon request.

# Section V - Tellabs Inc Case Study

When Graef Crystal (1998) analyzed CEO Stephen Bollenbach's compensation at Hilton Hotel group the author demonstrated that the compensation of the CEO far exceeded that of his predecessor, Barron Hilton, the hotel family founder successor. Gomez-Mejia et al. (2003) theorized that the difference between family and non-family CEOs compensation inside family firms can occur due to non-family CEOs demands of higher than average compensation to reward them for the risk of working in a family business. As Coli (2013) refer, the mixture between family ties and business activities produces not only a unique strength of strategic opportunities, but also an equal amount of risks and uncertainties that can seriously impact the equilibrium of the company itself. The author identifies several risks related to governance structure, growth strategy implementation and financing costs, among others, that may lead to non-family members demand for higher compensation.

In this section all CEO replacements occurred inside the defined sample used on section IV were selected. Figure 1 represents the year distribution of all the 29 CEO replacements that occurred between 2000 and 2010. The objective is to understand, through a direct comparison analysis, if when a family CEO is replaced by a non-family CEO, the last one will derive. Tellabs was chosen to be the particular case to be investigated in this analysis which intends to study to what extent a CEO replacement represents an executive compensation policy change. Following Graef Crystal (1998) study, the replacement of one a family CEO by a non-family CEO is expect to derive higher total compensation for the later one. The reverse mechanism, i.e., from non-family CEO to family CEO, will also be taken into consideration.

**Figure 1 – Year distribution of CEO replacements**
The sample covers 29 CEO replacements, 24 of them being from family to non-family and 5 from non-family to family during sample period 2000-2010.



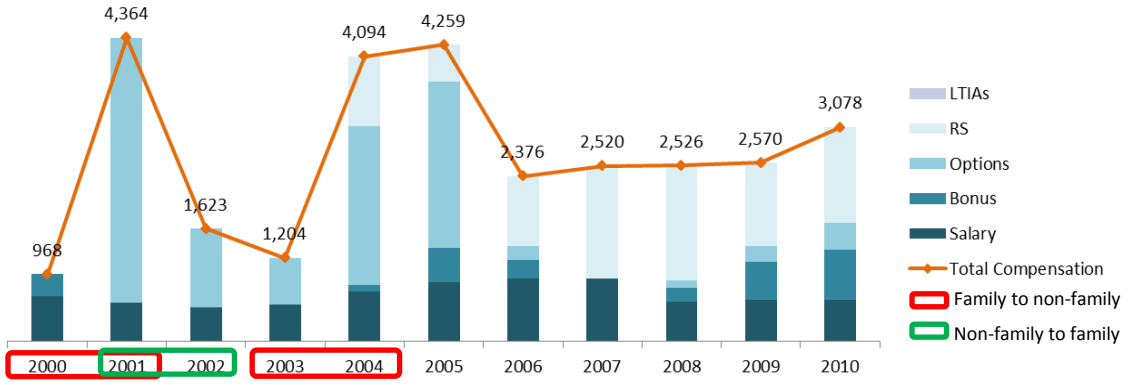

It is immediately observable that family to non-family replacements are more likely to happened than the reverse shift (24 against 5 replacements, respectively). From 2000 to 2006, the time period before the global financial crisis[16], more CEO replacements from family to non-family occurred possibly driven by a generally strong business growth stage where family firms were willing to take the next step and hire external CEOs to further improve their company performance (Block, 2009). Following the annual distribution, Tellabs contributes to 3 of those 29 events changing from family to non-family and from non-family to family and back to non-family during the 10 year period.

Tellabs is a global network technology provider that focuses on developing and delivering passive Optical Local Area Network (OLAN) and broadband access solutions for a wide variety of customers. Founded and run by Michael J. Birck, Tellabs presents a perfect case study for my direct comparison showing 3 CEO replacements that can be used to assess

[16] The financial crisis of 2007–08, also known as the global financial is considered by many economists to have been the worst financial crisis since the Great Depression of the 1930s. (Reuters, February 29, 2009). The collapse of large financial institutions was a constant threat which was only prevented by the bailout of some important banks by national governments. The crisis played a significant role in the failure of key businesses, declines in consumer wealth, and a downturn in economic activity leading to the 2008–12 global recession.

the respective impact over compensation packages. Figure 2 presents the annual distribution of Tellabs CEO total compensation with respective breakdown by component.

**Figure 2 - Year distribution of Tellabs CEO compensation**
The graph contains the total compensation evolution over the 10 year period of 2000 to 2010. Total compensation is expressed in units of thousands of dollars and includes all compensation components (salary, bonus, stock option, restricted stock, and LTIA)




Following the dot-com bubble[17] in 2000, Tellabs CEO, Michael Birck had a compensation package of $968 thousand mainly comprised of fixed salary (c.68%) and bonus (c.32%). During 2001 the first replacement took place and the company became led by a non-family CEO, Mr. Richard C. Notebaert, credited for saving Qwest from bankruptcy. By analyzing Graph 1 it is possible to notice a significant increase in CEO total compensation of approximately 351% to $4,364 million. In addition, the structure of compensation altered from the referred salary and bonus to a salary (c.13%) and options (c.87%).

However, Richard Notebaert was substituted one year after due to poor results and the former CEO Michael Birck took place again. As the company became family-controlled again, the compensation scheme also suffered changes and the total remuneration was brought back to similar past levels: $1,623 million of total compensation being comprised c.30% by fixed salary and c.70% of options. Mr. Birck remained on the top position of the

[17] The dot-com bubble is a historic speculative bubble covering roughly 1997–2000 period (with a climax on 10th of March, 2000) during which industrialized nations stock markets saw their equity value rise rapidly from growth in the internet sector and related fields.

management of Tellabs for 2 following years and compensation levels remained similar in such period.

Mr. Krish Prabhu, former chief operating officer of Alcatel, took over as CEO in February 2004 and represents the last change regarding family ownership. As observed in the first replacement with a non-family CEO, compensation package suffered significant changes. Total compensation sky rocked to $4,094 million and compensation structure also altered to a different scheme: salary became less significant to c.17.5%, options remained as the most important component with approximately 55.5%, bonus was reintroduced but with a small percentage around 2.5% and restricted stock was introduced in the package with an expression of c.24.5%.

Until 2005 total compensation kept on the same trend registering only an increase of 4%, whereas compensation structure varied slightly towards a package with more weight on bonus (c.12%) and less weight on restricted stock (c.12.5%). Mr. Prabhu stepped down only in March 2008 for personal reasons but the executive compensation package suffered significant changes from 2005 to 2006. However, the reason behind such job position shifts was related to the restructuring program Tellabs was employing to reduce costs which also covered CEO compensation package.

Between 2006 and 2010, executive total compensation evolved in a smooth yet increased pace reflecting good management results achieved during the period. The amount went from $2,376 million to $3,078 million during the referred period which results in a CAGR[18] of 6.69%. With regards to compensation structure, bonuses and options decreased magnitude until 2008 and gained more expression from 2008 onwards. Fixed salary also decreased from 2008 onwards with the same effect being observable for restricted stock. Also denote that LTIAs were never used by Tellabs as part of compensation scheme.

[18] CAGR is the short name for Compounding Annual Growth Rate.

This analysis presents evidence that supports the family control incentive alignment hypothesis. As referred, such hypothesis states that family CEOs possess superior incentives and have less need to receive additional incentives through their compensation from the firm. From what is observable on this simple analysis, the founding-family CEO is paid less when comparing to the non-founding-family CEO.

In line with McConaughy (2000), the results achieved may suggest that family-controlled firms have to pay nonfamily CEOs more to incentive them to perform at the same level that a family CEO would do. In other words, when Tellabs replaced its founding CEO, compensation levels have raised dramatically which might suggest that differences between family and nonfamily CEO compensation schemes do exist. Additionally, with regards to the control variables identified in section V as statically significant to explain total compensation[19], it was observed that none of such variables change significantly to cause such variation of total compensation.

On the other hand, when Mr. Birck got back to the CEO position, executive compensation levels significantly decreased and company results do not necessarily follow that trend. Such results suggest that intrafamily job market may provide lower executive compensation levels. According to Dekop (1988), founders and internally promoted CEOs receive less pay than CEOs recruited from outside of the firm. Family-member CEOs do not have to be attracted out of the CEO labor market, hired, retained, and given incentives which result in a lower total compensation levels. Moreover these results also suggest that founding family executives and compensation advisors to family-controlled firms should be sensitive to the fact that compensation costs may rise when outside CEOs or other top, nonfamily, executives are hired.

[19] Positive relation with firm size (measured by the logarithm of total sales) and firm performance (measured by ROA) and negative relation with leverage and shareholder returns (the later variable will not be considered in this analysis as it only has residual impact over compensation (-0.2%). Results are available upon request.

# Section VI - Conclusions and Discussion

This section is dedicated to concluding remarks extracted from all analysis conducted and pointing out to further discussions and future opportunities in family business compensation researches. Past literature has covered many aspects that help explain executive compensation the best example being the model developed by Combs & Skill (2003) that estimates the majority of the differences between family and non-family executives.

The major factors are attributed to firm size (Tosi et al., 2000), firm performance and other CEO job characteristics (Finkelstein & Boyd, 1998). CEO individual characteristics such as power over the compensation process or individual human capital[20] also influences the compensation packages (Combs & Skill, 2003). In addition, ownership concentration, large institutional investors (Gomez-Mejia et al., 1987) and CEO job market (Ezzamel & Watson, 1998) also demonstrate a significant effect on compensation. Likewise, the current focus regarding CEO compensation determinants is the amount of family representation.

Compared to total pay, much less is known about factors that affect the amount of option-based compensation offered. Despite Jensen & Murphy (1990a) study regarding the fact that firms offer less stock option compensation than agency theory might predict, the knowledge about how option-based compensation is still far from consensus.

The foundations of this study build on agency and stewardship theory arguments to explain the effect of family representation on CEO compensation. Methodically, the empirical analysis is aimed to confirm existing theory with regards to family incentive alignment hypothesis in family controlled businesses within U.S. publicly stock traded companies' universe. Without using non-family firms as a reference point, the mathematical regressions conclude that family control do not present statistical significance impact over

[20] Networks, knowledge, intellectual property, patents, teams, among others.

total compensation, compensation structure and pay to performance sensitivity. However such conclusions should be evaluated with some concerns.

The assumptions designed to define the data sample can bias the results and produce misleading implications. As stated by Westhead & Cowling (1998), family business research is sensitive to how family influence is defined. The family business definition employed in this research followed previous studies (e.g. Anderson & Reeb, 2003), yet, such broad definition does not reflect the true family influence over compensation. Moreover, recent literature has found new insights regarding levels of family representation that better explains compensation differences. Following Gomez-Mejia et al. (2003) discovers on executive compensation inside family firms, the authors define the type of family representativeness in the firm as the critical fact determining lower compensation levels of family-member CEOs. Results obtained by the authors corroborate that family-member CEOs of family firms with multiple family representatives receive lower total compensation. However, when the family-member CEO is the only family member involved, total compensation increases relative to CEOs at non-family firms.

It is intuitive to question why the number of family-members represented in management or on the board should influence family CEOs when they have strong incentives towards stewardship behaviours that lead to acceptance of lower compensations. Logical thinking argues that it should not matter how many family members are represented in the board. Conversely, agency theory suggests that one reason that family-member CEOs accept lower pay than non-family CEOs in firms with multiple family representatives is due to the fact that their compensation is supervised by the other family members.

The researcher´s hypothesis is that the additional family representatives engage in strategic control by evaluating CEO decision-making and monitoring the compensation process. In consequence, family-member CEOs become more willing to adopt stewardship

orientations and accept lower compensation on behalf of other benefits. In line with this argument is the inference from Combs et al. (2009) demonstrating that family-member CEOs compensation will increase when there are no other family representatives involved. The explanation relies on the fact that without family supervision, incentives for stewardship behaviours will diminish and family-CEOs will seek as much compensation as possible. As stated by agency theory and supported by studies as Villalonga & Amit (2006) and Young et al. (2008), family-CEOs would enjoy the full benefits of greater compensation but only bear the costs in proportion to their ownership shares.

Notwithstanding, data on the magnitude of family representation is not easily available and it was not possible to collect and incorporate into the regression model. Hiding such controls21 from the regressions limits the interpretation and veracity of the results achieved in this study and thus presenting opportunities for future research. If the purpose of family business research is to understand how family component impacts firms compensation policy, the suggestion would be to build a body of knowledge around the unique features of firms with multiple family representatives versus lone-family members. Such segmentation will allow a more reasonable comparison inside family controlled firms and consequent inference about the real determinants of compensation difference.

[21] Other controls may be related to US regulation regarding executive compensation for U.S. publicly traded firms or the relation between owning shares and voting power, among others.

# Appendix

### Variable Definition

Salary - The variable is the dollar value of salary.

Bonus - The variable is the dollar value of bonus plus target value of non-equity incentive-plan compensation; (if reported as nonzero).

Stock options (current grant) - Stock options are valued at fiscal year-end, so the stock price we use is the market price at fiscal year-end. In the calculation, I use 0.7 times the period between grant date and option expiration date as the option term, assuming a grant date of 1$^{st}$ of July of that year.

Stock options (prior grant) - I follow Core and Guay (2002) to approximately estimate delta for prior grants.

Restricted stock (current grant) - The variable is the dollar value of restricted stock. By dividing this number by the fiscal year end stock price, I estimate the approximate number of shares of restricted stock granted.

Restricted stock (prior grant) - This variable also includes common stock holdings.

Long-term incentive awards (LTIAs) (current grant) - By multiplying this number by the fiscal year-end stock price, I compute the value of stock granted under LTIAs.

LTIAs (prior grant) – I assume that the CEO holds each year's new grant for the time period of LT_PERIOD. I then use this number as the approximate value for prior LTIA grant. By dividing this number by the fiscal year end stock price, I estimate the number of shares of stock granted under LTIAs.

*P_Salary* - Dollar value of salary/dollar value of total compensation including salary, bonus, stock options, restricted stock, and long-term incentive awards.

*P_Bonus* - Dollar value of bonus/dollar value of total compensation including salary, bonus, stock options, restricted stock, and long-term incentive awards.

*P_Option* - Dollar value of stock options/dollar value of total compensation including salary, bonus, stock options, restricted stock, and long-term incentive awards.

*P_RS* - Dollar value of restricted stock/dollar value of total compensation including salary, bonus, stock options, restricted stock, and long-term incentive awards.

*P_LTIA* - Dollar value of long-term incentive awards/dollar value of total compensation including salary, bonus, stock options, restricted stock, and long-term incentive awards.

*Delta_c* - (Black-Scholes Delta of all current option grants + number of shares of current restricted stock grants + number of targeted shares granted under LTIA) × (fiscal year-end price × 0.01).

*Delta_t* - (Black-Scholes Delta of all current option grants + number of shares of current restricted stock grants + number of targeted shares granted under LTIA + Black-Scholes Delta of all prior option grants + number of prior shares of restricted stock + number of prior shares granted under LTIA) × (fiscal year-end price × 0.01).

Black-Scholes Delta of options - First partial derivative of value of option with respect to stock price (Stock Return Volatility).

Family Control - Dummy that equals 1 if CEO belongs to the family.

Sales - Total sales in thousands of U.S. dollars.

Leverage - Book value of long term plus current debt divided by total assets.

ROA - Net income divided by total assets.

Shareholder Returns - Change in stock price over the year plus dividends paid divided by the stock price at the start of the year.

Stock Return Volatility - Annualized standard deviation of daily stock return.

Age - Age of CEO in years.

Gender - CEOs gender.

Tenure - Number of years as top executive in the firm.

**Table A1 - Simple OLS estimation describing changes in the structure of CEO compensation between family and non-family controlled firms.**

The sample consists of 4,124 firm-year observations over the 10 year period of 2000 to 2010. Some equations have a reduced sample size as both firm specific and individual CEO characteristics are not available for some of the compensation data. Log_Total_Comp is the logarithm of the dollar value of total compensation (including salary, bonus, stock option, restricted stock, and LTIA and in units of thousands of dollars) for each CEO. *P_Salary*, *P_Bonus*, *P_Option*, *P_RS*, and *P_LTIAs* are the fractions of total compensation coming from those individual components of pay. The independent variables in the regressions include an indicator (*Family_Control*) equal to one for the family-controlled firms (which is defined as having a family-member as a CEO) and zero otherwise and other control variables that include firm and individual characteristics. Variables are defined in Section III. The table reports *t*-statistics based on robust standard errors clustered at the industry level in parentheses. *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | ***Log_Total_Comp*** | ***Log_Total_Comp*** | ***Log_Total_Comp*** | ***P_Salary*** | ***P_Salary*** | ***P_Salary*** | ***P_Bonus*** | ***P_Bonus*** | ***P_Bonus*** |
| **Family_Control** | -0.067 | -0.056 | 0.027 | 0.026 | 0.031 | -0.005 | 0.014 | 0.013 | -0.001 |
| | (0.206) | (0.191) | (0.219) | (0.034) | (0.034) | (0.038) | (0.018) | (0.019) | (0.019) |
| **Log_Sales** | 0.322*** | 0.361*** | 0.352*** | -0.033*** | -0.035*** | -0.032*** | 0.012** | 0.010* | 0.011* |
| | (0.050) | (0.051) | (0.052) | (0.008) | (0.007) | (0.008) | (0.005) | (0.005) | (0.005) |
| **ROA** | | -0.029 | -0.079 | | -0.100 | -0.109* | | 0.184*** | 0.179*** |
| | | (0.477) | (0.487) | | (0.066) | (0.066) | | (0.061) | (0.063) |
| **Shareholder_Return** | | -0.001 | -0.002 | | 0.000** | 0.000** | | -0.000 | -0.000 |
| | | (0.001) | (0.001) | | (0.000) | (0.000) | | (0.000) | (0.000) |
| **Leverage** | | -0.048 | -0.057 | | -0.006 | 0.002 | | 0.005 | 0.013 |
| | | (0.308) | (0.309) | | (0.045) | (0.045) | | (0.027) | (0.028) |
| **Volatility** | | 0.356* | 0.361* | | -0.007 | -0.007 | | -0.031 | -0.029 |
| | | (0.185) | (0.190) | | (0.035) | (0.035) | | (0.025) | (0.025) |
| **Tenure** | | | -0.008 | | | 0.003** | | | 0.001 |
| | | | (0.010) | | | (0.001) | | | (0.001) |
| **Age** | | | 0.002 | | | 0.000 | | | 0.001 |
| | | | (0.007) | | | (0.001) | | | (0.001) |
| **Gender** | | | 0.051 | | | 0.009 | | | -0.013 |
| | | | (0.140) | | | (0.029) | | | (0.028) |
| **Observations** | 4,124 | 4,029 | 3,985 | 4,124 | 4,029 | 3,985 | 4,124 | 4,029 | 3,985 |
| **R-squared** | 0.284 | 0.296 | 0.296 | 0.216 | 0.218 | 0.218 | 0.264 | 0.269 | 0.275 |

**Table A1- (Continuation)**

| Variables | (10) *P_Option* | (11) *P_Option* | (12) *P_Option* | (13) *P_RS* | (14) *P_RS* | (15) *P_RS* | (16) *P_LTIAs* | (17) *P_LTIAs* | (18) *P_LTIAs* |
|---|---|---|---|---|---|---|---|---|---|
| **Family_Control** | 0.060 | 0.043 | 0.068 | -0.077*** | -0.068*** | -0.053** | -0.022*** | -0.020** | -0.009 |
| | (0.046) | (0.048) | (0.048) | (0.024) | (0.025) | (0.027) | (0.008) | (0.009) | (0.010) |
| **Log_Sales** | -0.004 | 0.023** | 0.023** | 0.010 | -0.009 | -0.012 | 0.015*** | 0.011*** | 0.011*** |
| | (0.009) | (0.009) | (0.010) | (0.007) | (0.008) | (0.008) | (0.003) | (0.004) | (0.004) |
| **ROA** | | 0.141 | 0.138 | | -0.086 | -0.070 | | -0.139*** | -0.138*** |
| | | (0.086) | (0.088) | | (0.073) | (0.073) | | (0.037) | (0.037) |
| **Shareholder_Return** | | -0.001*** | -0.001*** | | 0.001*** | 0.001*** | | 0.000 | 0.000 |
| | | (0.000) | (0.000) | | (0.000) | (0.000) | | (0.000) | (0.000) |
| **Leverage** | | -0.172*** | -0.181*** | | 0.136*** | 0.127*** | | 0.037* | 0.039* |
| | | (0.047) | (0.048) | | (0.044) | (0.045) | | (0.022) | (0.021) |
| **Volatility** | | 0.328*** | 0.326*** | | -0.185*** | -0.184*** | | -0.105*** | -0.106*** |
| | | (0.048) | (0.047) | | (0.040) | (0.040) | | (0.025) | (0.025) |
| **Tenure** | | | -0.001 | | | -0.002 | | | -0.001* |
| | | | (0.002) | | | (0.001) | | | (0.001) |
| **Age** | | | -0.002 | | | 0.000 | | | 0.000 |
| | | | (0.001) | | | (0.001) | | | (0.001) |
| **Gender** | | | 0.007 | | | -0.040 | | | 0.036 |
| | | | (0.050) | | | (0.054) | | | (0.029) |
| **Observations** | (0.080) | (0.087) | (0.111) | (0.062) | (0.075) | (0.102) | (0.030) | (0.042) | (0.057) |
| **R-squared** | 4,124 | 4,029 | 3,985 | 4,124 | 4,029 | 3,985 | 4,124 | 4,029 | 3,985 |

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