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Equity-based compensation as incentive for CFO’s fiduciary and managerial performance

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# Abstract

This study links CFO’s performance to equity based compensation and investigates the effectiveness of equity as an incentive for a CFO. Besides, this study distinguishes managerial duty and fiduciary duty as the two elements of the total duty of a CFO. The analysis is based on two databases of “S&P 1500” firms with CFO performance measures and CFO compensation data for the years 2006 to 2014. The results indicate a significant positive relation between equity compensation and CFO’s managerial performance, but shows no relation between equity compensation and CFO’s fiduciary performance. A regression indicates that CFO’s fiduciary and managerial performance are not associated with CFO’s total performance.

# Executive Summary

Several corporate failures heated up the debate concerning executive compensation and financial reporting quality. The provision of proper incentives is crucial in order to stimulate the concerned executives such as the CEO and CFO and align them with the goals of the shareholders. Equity based compensation is widely used as an incentive for CFOs in order to maximize their performance in the line of the organisation. In this typical principal-agent setting, performance measurement plays an important role. However, previous research on CFO performance measurement is scarce. Hoitash, Hoitash, & Johnstone (2012) and Indjejikian & Matêjka (2009) analyse the CFO performance and divide this into the managerial and fiduciary performance. Prior studies of proponents (e.g. Grossman & Hart, 1986; Hölmstrom, 1979; Jensen & Murphy, 1990) and opponents (e.g. Armstrong, Larcker, Ormazabal, & Taylor, 2013; Bergstresser & Philippon, 2006; Cheng & Warfield, 2005; Cheng & Farber, 2008) of equity based compensation can be pointed out clearly, but do not provide consistent results. This thesis links CFO performance to CFO equity based compensation and aims to answer the question: “What is the influence of equity based compensation on the managerial and fiduciary performance of the CFO?”.

The analysis is based on two databases of “S&P 1500” firms that are fused together into one database with CFO performance measures and CFO compensation data. This results in an initial dataset of 15936 records of 2314 unique firms for the years 2006 to 2014. The statistical analysis uses an Independent T-test, One-Way ANOVA and Ordinary Least Squares regression, which can all be found in the Appendix. The results indicate that the presence of equity in a CFO’s compensation package has a positive effect on CFO’s managerial performance, but no effect on CFO’s fiduciary performance. Moreover, an increase in the proportion of equity compensation has a positive association with CFO’s managerial performance indicating a linear effect, but no association with his fiduciary performance. A regression indicates that the CFO’s managerial and fiduciary performance are not associated with CFO’s total performance. This undermines the assumption that CFO’s total duty consist of only a managerial and fiduciary duty (Hoitash, Hoitash, & Johnstone, 2012; Indjejikian & Matêjka, 2009). The association between the proportion of equity compensation and CFO total performance is not significant either. This means that the influence of equity in a compensation package on CFO performance is only significant for the managerial performance of the CFO, but not for the fiduciary and total CFO performance. These findings contribute to the discussion with regard to equity compensation, yet remain inconclusive.

Regarding the principal-agent setting, one could conclude from this study that equity based compensation only partially stimulates executive motivation, namely regarding managerial performance.

From an internal control point of view, this implies that equity compensation is highly ineffective to stimulate fiduciary performance. From the perspective of SOx initiators and enforcers, this means that there is still too much reliance on financial performance and too little on fiduciary performance.

These conclusions are less in line with current literature than expected. Possibly due to undermining a fundamental assumption that CFO’s total performance is the sum of managerial and fiduciary performance (Hoitash et al., 2012; Indjejikian & Matêjka, 2009). However, this study shows that the measurement of CFO performance should be more sophisticated than the variables used in this study, since a regression indicates that CFO total performance is not associated with either managerial performance or fiduciary performance.

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# 1 Introduction

In reaction to several corporate failures, recent regulations have been aimed at strengthening financial reporting and governance practices such as executive compensation. The two executives that are focal points of these new regulations are the CEO and CFO. Previous research has been performed regarding CEO performance and incentive systems (Banker, Potter, & Srinivasan, 2000; Ittner, Larcker, & Rajan, 1997; Jensen & Murphy, 1990). Even though the function of the CFO is not less important, CFO performance and incentive systems are much less investigated in current research.

The CFO is expected to act on behalf of the shareholders of a firm, since they are legally the owner. This is where the elements of classical agency theory become visible (Jensen & Meckling, 1976). *“If both parties, the CFO as agent acting for the principal, i.e. the shareholder, are utility maximizers, there is good reason to believe that the agent will not always act in the best interests of the principal”* (Jensen & Meckling, 1976 p.5). The contractual relation between the principal and agent should be constructed in such a way that it provides appropriate incentives for the agent to make choices which maximize the principal’s welfare (Jensen & Meckling, 1976). The effort of the CFO should be aligned with the goal of the company and thus enhance the creation of shareholder value.

To achieve the goal of maximizing shareholder value, the most effective manner is to maximize long-term value rather than managing for short-term earnings (Rappaport, 2005). Several studies find evidence that it motivates managers to make value-maximizing decisions when their compensation is tied to firm performance (e.g. Harris & Raviv, 1979; Hölmstrom, 1979) and that the form, rather than the level of compensation, is what motivates executives (Mehran, 1995). Although several studies argue that it is not optimal to fully base compensation on the firm’s stock price (Paul, 1992; Sloan, 1993), Jensen and Murphy (1990) suggested equity-based compensation in order to motivate a manager more effectively (Jensen & Murphy, 1990), since the manager is basically exerting effort for his own utility, which should minimize the agency problem.

However, CFO compensation is also highly dependent on the financial reporting system, which is controlled by the CFO himself (Indjejikian & Matêjka, 2009). Since many CFOs are awarded bonuses based on what is effectively self-reported performance, this is a questionable aspect of CFO performance measurement (Indjejikian & Matêjka, 2009).

Prior research distinguishes with regard to the role of the CFO within the firm as consisting of two separate duties (Hoitash et al., 2012; Indjejikian & Matêjka, 2009). Firstly, the CFO has managerial duties and contributes to decision making such as any other senior manager. Secondly, he or she must report on the firm’s financial performance, keeping the greater good of the firm and subsequently the shareholder in mind. This is described as the fiduciary duty[[1]](#footnote-1): *“the production of financial statements that fairly represent the financial condition of a firm”* (Indjejikian & Matêjka, 2009 p.1062). The priority of the responsibilities of the CFO can influence the design of compensation contracts and in particular the choice of performance measures in a financial executives’ compensation plan (Indjejikian & Matêjka, 2009).

## 1.1 Research question

The main problem is thus the alignment of the CFO’s goals with the goals of the shareholders, which, according to the literature, can be influenced by including firm’s equity in the CFO’s compensation package. It is often not taken into account that the CFO actually has two responsibilities: a fiduciary duty and a managerial duty. This thesis focusses explicitly on the performance of the CFO with regard to the fiduciary and managerial responsibility. This leads to the following research question:

*What is the influence of equity compensation on the fiduciary and managerial performance of the CFO?*

## 1.2 Managerial relevance

A number of major accounting scandals increased the attention on reliable corporate governance, with the enactment of the Sarbanes-Oxley Act as a result. This United States federal law set new requirements for US public firm boards and management on July 30, 2002 (US House of Representatives, 2002). Section 302 and 404 are considered as the elements of SOx with the most impact, since it requires the management and external auditor to evaluate the firm’s internal control on financial reporting. The outcome of the evaluation may include an ‘Internal Control Material Weakness’, which means that an internal control is so deficient, that it could lead to material financial misstatements. Therefore, since the introduction of SOx, the duty of a CFO is even under more scrutiny. Besides, the findings of this thesis are of interest to the initiators and enforcers of SOx.

The results of this study are relevant to shareholders and boards of directors, since it provides insight into the effects of equity compensation in the executive compensation system. Ultimately, the board of directors is the entity that constructs the incentive systems for the top executives on behalf of the shareholders. This thesis clarifies the impact of equity compensation on CFO performance, which may be useful for decision making of the boards of directors regarding the incentive systems for the CFO. The shareholders relinquish the management of the firm to the board of directors, and they are thus interested in decisions that affect the performance of their asset.

## 1.3 Scientific relevance

This thesis on compensation regarding the CFO performance is related to other studies that explicitly distinguish the CFO fiduciary and managerial duty. There is evidence[[2]](#footnote-2) that firms decrease emphasis on the managerial duty in the post-SOx years (Indjejikian & Matêjka, 2009), which can be interpreted as an increased emphasis on the fiduciary performance. Other research finds a negative relation between CFO bonus compensation and disclosure of an internal control material weakness, which can be seen as a measure for fiduciary performance (Hoitash et al., 2012). By explicitly distinguishing these two CFO responsibilities, this thesis provides for clarification in a research area where theoretical and empirical evidence is scarce. Regarding the CFO’s fiduciary and managerial duty, this thesis extends prior studies by examining the relation between fiduciary and managerial performance and CFO’s compensation incentives (Hoitash et al., 2012; Indjejikian & Matêjka, 2009).

In addition to the direct link between CFO compensation and CFO performance, this thesis considers the influence of equity as a compensation component, of which the aim is to increase goal alignment between the CFO and the company. Regarding equity as executive compensation, this thesis extends studies that consider equity as a more effective compensation system (e.g. Jensen & Murphy, 1990), and studies that argue that it is not fully optimal to use equity as the only compensation component (e.g. Paul, 1992; Sloan, 1993). A considerable amount of literature investigated the association between equity compensation and financial misreporting, but the results have been mixed (Armstrong et al., 2013; Bergstresser & Philippon, 2006; Erickson, Hanlon, & Maydew, 2006; Larcker, Richardson, & Tuna, 2007). This thesis aims to provide more clarity with regard to the relation between equity incentives and, not only taking misreporting into account, but the fiduciary and managerial role, more specifically CFO performance in its entirety.

## 1.4 Outline

This thesis consists of six chapters that each contain a part of the thesis. In chapter 2, relevant previous literature is reviewed and a conceptual framework is constructed. In chapter 3, the hypotheses are presented, discussed and specified. The sample and variables and methodological issues are discussed in chapter 4. In chapter 5, the results are presented and in chapter 6 draws a conclusion along with a discussion of the results, limitations of the thesis and raises ideas for future research. Chapter 7 contains the references and chapter 8 is the Appendix.

# 2 Literature review

The main concepts that are related to the research question are discussed in this chapter to provide a comprehensive overview of the different models, definitions, and empirical evidence regarding the association between CFO compensation and CFO performance. The goal of this literature review is to indicate the importance of the research question by identifying gaps or controversies in previous research and critically reviewing the methodologies that are used.

The content of the literature review is divided into three main topics. Firstly, literature regarding the position of the CFO within the governance structure is elaborated upon. Secondly, the literature regarding control systems, compensation, and performance measurement is reviewed. Thirdly, the literature regarding the performance on the fiduciary and managerial responsibility of the CFO is examined.

## 2.1 The CFO within the governance structure

Before discussing the general responsibilities of a CFO, the position of the CFO is assessed within the governance structure. This paragraph provides the theoretical framework for this thesis by examining the position of the CFO by explaining important agency theory and information asymmetry concepts.

### 2.1.1 Agency theory

According to Agency Theory, the corporate structure of the firm can be separated in two parts: the ownership part of the firm and the control part of the firm. Jensen and Meckling (1976) are the authors of the well-known paper *Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure,* which created the foundation for the agency theory in general. They suggest that if a wholly-owned firm is also managed by the owner, the owner will make operating decisions that maximize utility. This includes not only the utility derived from monetary returns, but also the utility that is generated by various non-monetary aspects[[3]](#footnote-3) of the entrepreneurial activities. Since he is also the only owner, the value of the firm contributes completely to his or her own utility. This ensures that, in theory, the goals of the managers are perfectly aligned with the goals of the firm. If the owner sells the equity to outsiders, a divergence between interests merges between the interests of the initial owner and the outside shareholders, since shareholders pursue maximisation of their own utility (Jensen & Meckling, 1976). The most important conflict arises from the fact that as the manager’s ownership decreases, the manager loses significant incentives to exert effort on behalf of the firm, because his or her effort is not directly beneficial for his or her own utility. Jensen and Meckling define this principal-agent relationship as *“a contract under which one or more persons (the principal) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent”* (Jensen & Meckling, 1976 p. 5). This view can be projected on a regular firm, which is controlled by the executives (agents), but owned by the shareholders (principals). If all personnel would always act in the best interest of the organisation, controls, and even management, would not be needed. However, in reality controls are needed in order to improve goal alignment between the shareholders and the employees, including the CFO (Merchant, 1982).

An important factor of the agency problem is information asymmetry. This is described as an transaction where relevant information in known to some but not all of the parties involved. Due to this information asymmetry, the principal does not have the same information regarding the agent’s effort and performance as the agent himself. To decrease the information asymmetry, the principal establishes performance measures and other elements of a control system.

## 2.2 Control systems

The previous paragraph argues that the principal has to construct and maintain a control system so that the agent exerts effort in the desired direction. Merchant & Van der Stede (2007) define “perfect control” as *“complete assurance that all control systems are fool proof and all individuals on whom the organization must rely always act in the best way possible”* (Merchant & Van der Stede, 2007, p.12)*.* *“Good control means that the management can be reasonably confident that no major unpleasant surprises will occur. The label “out of control” is used to describe a situation where there is a high probability of poor performance, either overall or in a specific situation performance area, despite having a sound strategy in place”* (Merchant & Van der Stede, 2007, p.12). This paragraph continues with this concept by explaining the aspects of control systems according to Merchant & Van der Stede (2007). They published a comprehensive overview of management control systems and elaborated on performance measurement, evaluation and incentives.

As already explained, to increase the chance that the CFO will act in the best interests of the organisation, the organisation can establish a control system with appropriate incentives to limit the aberrant activities of the agent. Maintaining a control system involves direct[[4]](#footnote-4) and indirect[[5]](#footnote-5) costs, so the principal must make a well-considered decision which controls are beneficial to implement (Merchant & Van der Stede, 2007).

Because ‘control systems’ is a broad concept, Merchant and van der Stede primarily focus on result controls, which include motivating employees to act according to the goals of the organisation. Result controls require performance measures and the provision of incentives, which are dominant factors in most organisations (Merchant & Van der Stede, 2007). Since the CFO compensation and performance are considered result controls, this thesis only focusses on results controls, which means it does not elaborates on action controls[[6]](#footnote-6) or cultural[[7]](#footnote-7)/personnel[[8]](#footnote-8) controls, which are also part of the management controls to effectuate control within an organisation.

### 2.2.1 Incentives

After the board of directors provides a clear performance definition[[9]](#footnote-9) to the CFO, an important component of the control system comes in: different incentives. These are described as things that someone values, so that it motivates him or her to perform a certain action.

When an incentive is approached from an micro-economic point of view, it must have a certain value in the costs-benefits equation of an agent. When we assume an agent to be rational, it is possible to analyse his decision-making behaviour based on the costs-benefits net value for action ‘X’. When the benefits exceed the costs, the agent will choose to perform action ‘X’, but when the costs exceed the benefits, the agent will not perform action ‘X’ (Frank, 1991). Incentives can be translated to benefits in order to stimulate the agent to perform action ‘X’, since his net value of action ‘X’ increases. The salary or a bonus is an example of a positive incentive. Incentives can also be translated to costs, which decrease the value of action ‘X’, and make is less likely that the agent performs the action. Fines or penalties are examples of negative incentives. In organisations, incentives can be provided through positive rewards or negative rewards (Merchant & Van der Stede, 2007). It is common to use the absence of a positive reward as punishment (Merchant & Van der Stede, 2007). However, this analysis only holds when agents are rational, which is frequently not the case (Frank, 1991).

### 2.2.2 Compensation

In large corporations, the board of directors is responsible for compensating the CFO. The compensation depends on the situation on the labour market, but also on the amount of effort that the CFO has to exert as a consequence of the complexity of the task or the size of the company. That is why a CFO whose expertise is on short supply or who is supposed to exert higher effort is compensated more (Grinstein & Hribar, 2004). This thesis focusses only on cash compensation and equity-based compensation, since these forms of compensation are easy to quantify and compare, because of their homogeneity. The following paragraphs elaborate on these two forms of compensation. Other forms of compensation such as promotion, autonomy, recognition or titles are more qualitative in nature and therefore it is difficult to derive parameters for quantitative research.

#### 2.2.2.1 Monetary compensation

Monetary compensation can be provided in three ways: salary increases, short-term incentive plans, and long-term incentive plans. A salary increase often relates to the skills that may lead to future performance. Short-term incentives include bonuses, commissions and piece-rate payment. Short-term compensation holds a direct link to the task performance, for tasks with low complexity and high measurability. The performance of production line workers, for example, can be easily measured. Therefore, these kind of tasks are often compensated with bonuses or piece-rate payment, which only provides incentives on the short term while employees are working.

Long-term incentives are based on performance over more than a year to stimulate long-term value creation. In the first place, long-term incentive systems are aimed at increasing performance of the higher levels of management since their performance influences the long-term value of the firm. These incentives are often provided by tying performance to shares of the company. This form of compensation is elaborated on extensively in the paragraph “Equity compensation”. An additional aim of long-term incentives is to retain good employees, since they are only compensated when they remain loyal to the firm.

The general hypothesis is that monetary compensation leads to greater effort than would have been the case in their absence (Bonner & Sprinkle, 2002). Bonner and Sprinkle reviewed theories and evidence regarding the effects of monetary incentives on individual effort and task performance. The use of monetary compensation is increasing and several reviewed publications suggested a positive influence on a person’s performance (e.g. Atkinson, Banker, Kaplan, & Young, 2001; Horngren, Foster, & Datar, 2000; Zimmerman, 2000).

#### 2.2.2.2 Empirical evidence on monetary compensation and performance

Empirical evidence, indicates however, that monetary incentives can have very different effects and therefore do not always improve effort nor performance (Bonner, Hastie, Sprinkle, & Young, 2000; Jenkins Jr, 1986; Jenkins Jr, Mitra, Gupta, & Shaw, 1998; Kohn, 1993). Bonner et al. (2000) reviewed laboratory studies regarding the relation between monetary incentives and performance. They concluded that as the gap between job complexity and skill increases, the less effective financial incentives become to stimulate performance. Jenkins (1986) reviewed 28 studies from 1960 to 1985 and came to the conclusion that financial incentives only affect the performance quality, but not the quantity. Years later, after reviewing 39 studies from 1975 to 1996, Jenkins et al. (1998 ) still draws the same conclusion as in the previous review that there is no relation between financial incentives and performance quality, although there is a relation between financial incentives and performance quantity. Other research is more pessimistic about monetary incentives (Kohn, 1993). Kohn (1993) argues that monetary incentives are psychological manipulations and incentives do not have a positive influence on task performance.

Other significant arguments against monetary incentives capture the detrimental effects of monetary compensation on intrinsic motivation. Intrinsic motivation is distinguished from extrinsic motivation on the basis of the incentive that is related to the activity. The incentive for intrinsic motivation is the feeling of competence and self-determination, while the reward for extrinsic motivation is separate from and follows the behaviour (Frey & Jegen, 2001). Several studies have shown that monetary payment systems tend to undermine intrinsic motivation (Deci & Ryan, 1985; Kohn, 1993) and thus can reduce effort and job performance.

For an overview of the relevant literature regarding the relation between monetary compensation and performance, see the tabular summary in the Appendix with concise description of the articles.

#### 2.2.2.3 Equity compensation

The most common form of rewarding is monetary, elaborated on in the previous paragraph. Executives, however, are often rewarded with shares of the organisation. This should provide an extra incentive, since the executive basically becomes partly owner of the organisation and therefore not only acts in the best interest of him as an employee, but also in the best interest of him as an owner. When these two interest are more aligned, the agency problem decreases. Equity-based incentives plans come in various forms and are based on performance measured over periods greater than one year. The goal is to reward executives for their performance in creating long-term value.

Stock option plans provides executives the right to purchase a number of company shares at a set price within a certain period. Executives only benefit when the stock price goes up, which motivates them to do their best for the organisation, knowing that their performance influences firm performance, and firm performance influences the stock price. Another advantage of stock option plans is that firms can provide compensation, while firms do not have to use cash to reward an executive for exerted effort. Consequently, this generates a positive cash flow for cash constrained firms[[10]](#footnote-10). Stock option plans also have some disadvantages. Since option plans represent a future issuance of stocks, managers are only rewarded for profits, but not for losses. This can result in risky-taking behaviour, which leads to stock price volatility (Rajgopal & Shevlin, 2002). Other criticism on equity-based compensation is that stock prices can increase or decrease due to other factors than firm performance. Despite the more long-term oriented character of equity compensation, executives can still be motivated to perform actions that increase the share price for only a short period, but decrease value in the long term (Core, Guay, & Larcker, 2003).

Another form of equity-based compensation is a restricted stock plan, which means that the employee receives stocks that are only tradeable during a specific period of time, named the vesting period. The employee is allowed to acquire the stocks against a predetermined price, called the strike price. The difference between the strike price and the market price is on behalf of the employee and not on the firm. This form of payment has the advantage that the employee bears the cost of a decreasing share price, since he or she already owns the stocks. This makes restricted stock plans less risky and a more effective compensation tool, in particular in case of continued employment. However, the image of restricted stock plans is that stocks are not used for performance incentives, but just easy giveaway items, because they are relatively easy to give out (Core et al., 2003).

To emphasize pay-for-performance directly, equity compensation can also take the form of performance awards, by tying bonuses to the performance of stock or non-stock goals over more than one year. This compensation dependency on performance occurs in very different forms (Core et al., 2003).

#### 2.2.2.4 Empirical evidence on equity compensation and performance

Several studies find evidence that it motivates managers to make value-maximizing decisions when their compensation is tied to firm performance (Grossman & Hart, 1986; Harris & Raviv, 1979; Hölmstrom, 1979) although they use very theoretical models which are not empirical. Mehran (1994) underscores the importance of the form rather than the level of compensation. In a study of 153 manufacturing firms, he finds evidence that firm performance is positively related to the percentage of compensation that is equity-based (Mehran, 1995).

According to the findings of Jensen and Murphy, equity is an effective form of compensation, since it better aligns the goals of the company with the goals of the executive (Jensen & Murphy, 1990). However, Jensen and Murphy also argue that their significant empirical evidence of an positive relation is too small for an occupation in which compensation is expected to have a large impact. The assumption that the executive tries to maximize his own utility should result in exerting more effort to influence the company’s share price, which is also the goal of the shareholders.

However, other studies argue that it is not optimal to base compensation fully on equity (Paul, 1992), since stock prices provide a noisy measure of executive performance (Sloan, 1993). Paul (1992) explained that for an optimal incentive contract, information should be weighted according to informativeness about the value added by the executive. The stock price, however, is only an asset’s value, but does not reflect the value added. Therefore, the stock price would not be the optimal measure that reflects the value added in a principal-agent setting. Sloan (1993) provides evidence that earnings better reflect a firm-specific value than the stock market and therefore, is a better measure of performance, which endorses the findings by Paul (1992).

There is a considerable amount of literature that provides evidence of a positive relation between CEO equity incentives and misreporting (Armstrong et al., 2013; Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Cheng & Warfield, 2005; Cheng & Farber, 2008; Cornett, Marcus, & Tehranian, 2008; Efendi, Srivastava, & Swanson, 2007), while others found no relation (Armstrong, Jagolinzer, & Larcker, 2010; Erickson et al., 2006; Larcker et al., 2007). Only a few studies made a distinction between the CEO and the CFO, but the results were again very mixed. One study found evidence only for a positive relation between CFO’s equity compensation and misreporting, but not for the CEO (Jiang, Petroni, & Wang, 2010). Another study, however, found evidence of a positive relation between CEO’s equity compensation and misreporting, but not for the CFO (Feng, Ge, Luo, & Shevlin, 2011).

For an overview of the relevant literature regarding the relation between equity compensation and performance, see the tabular summary in the Appendix with concise description of the articles.

### 2.2.3 Performance measurement

As already explained, CFO compensation is a type of result control. An important part of a result control system is performance measurement. The principal uses a contract in order to evaluate and compensate the agent on observed performance. Since direct performance measures are rarely possible, because of the high complexity of tasks, this requires performance measures that proxy the agent’s performance. However, the principal must deal with information asymmetry and monitoring costs, which often results in an imperfect performance measurement (Jensen & Meckling, 1976; Merchant & Van der Stede, 2007).

The conventional way to measure performance is based on financial metrics (Schiehll & Bellavance, 2009), such as earnings per share or return on investment. Although CFO compensation is still strongly related to firm financial performance (Gore, Matsunaga, & Yeung, 2011), recent studies report an increasing use of non-financial measures. These are measures such as market share, efficiency, productivity, product quality, customer satisfaction and employee satisfaction (Banker et al., 2000; Indjejikian & Matêjka, 2009). Non-financial measures can be better predictors of long-term financial performance than financial measures, since non-financial measures are proven to be leading indicators and are linked to the lagging indicators such as financial performance (Banker et al., 2000).

However, in most of the cases the compensation of the CFO is based on only financial performance measures. This actually means that CFOs are evaluated based on performance measures they generate themselves (Indjejikian & Matêjka, 2009), which increases the chance of manipulation and incorrect performance measurement.

## 2.3 CFO responsibilities

The previous section describes the various elements of the control system for the CFO to align the CFO’s goals with the company goals. This section explains in which direction the CFO’s effort must be aligned, in other words: what are the responsibilities of the CFO? The literature distinguishes two responsibilities of the CFO: the managerial responsibility and the fiduciary responsibility (Hoitash et al., 2012; Indjejikian & Matêjka, 2009). Subsequently, the total CFO performance is examined.

### 2.3.1 The fiduciary responsibility

The fiduciary responsibility of the CFO implies the production of financial statements that fairly represent the firm’s financial position (Indjejikian & Matêjka, 2009). Firm’s financial statements summarize the economic consequences of its business activities. However, the firm’s business activities in any time period are too numerous to be reported individually to outsiders. Further, the competitive position of a firm would be harmed by disclosing information that is proprietary. Therefore, the firm’s accounting system provides a mechanism through which business activities are selected, measured, and aggregated into financial statement data (Palepu, Healy, & Peek, 2007). Investors and other stakeholders rely on these financial statements to assess the plans and performance of firms and corporate managers (Palepu et al., 2007).

### 2.3.2 Empirical evidence of the fiduciary responsibility

The executive position of the CFO makes it very likely that he has the most control over the quality of the reports of the firm, and thus is a very important determinant in the reporting process (, 2001). This importance of the function of the CFO is underscored by Geiger and North, who investigated the association between accruals[[11]](#footnote-11) and the appointment of a CFO to the board. They found that discretionary accruals decrease significantly after the appointment of a new CFO (Geiger & North, 2006). Discretionary accruals are, as opposed to non-discretionary accruals, not caused by business conditions, but by management choices. Therefore, discretionary accruals are often noted as a measure of earnings management and indicate lower quality of reports (Geiger & North, 2006), so the appointment of a new CFO leads to significantly higher quality of financial reports. Moreover, other research found evidence for the importance of CFO in improving internal control and financial reporting quality (Abernethy, Bouwens, & van Lent, 2004; Li, Sun, & Ettredge, 2010).

Regarding the fiduciary responsibility, Hoitash et al. (2012) examine the effects of CFO fiduciary duties on compensation outcomes, while controlling for CFO managerial duties. The disclosure of an internal control material weakness is used as the measure of CFO fiduciary performance. Their study provides evidence that changes in CFO total, bonus and equity compensation are negatively associated with internal control material weaknesses[[12]](#footnote-12) disclosures (Hoitash et al., 2012). CFO compensation decreases when an internal control material weakness is disclosed, which implies that de CFO is in some degree held responsible for the internal control material weakness. Ineffective internal controls increase the risk of misstatement, which results in less reliable financial statements (Doyle, Ge, & McVay, 2007; Lambert, Leuz, & Verrecchia, 2007; Ashbaugh-Skaife, Collins, Kinney Jr, & LaFond, 2008). Other undesirable consequences of weak internal controls are higher cost of capital (Ashbaugh‐Skaife, Collins, & LaFond, 2009), higher audit fees (Hoitash, Hoitash, & Bedard, 2008), lower bond ratings (Hammersley, Myers, & Zhou, 2012), auditor resignations (Elder, Zhang, Zhou, & Zhou, 2009) and reputational damage.

Johnstone et al. (2011) investigated the association between changes in corporate governance and the revelation of material negative events. They found evidence of a positive association between a material negative event and subsequent and turnover of members of the board of directors, audit committees, and top management. These results indicate that these groups are held responsible for material negative events, but more important for this thesis, they use the disclosure of an internal control material weakness as the proxy for a material negative event.

Other literature writes about the relation between CFO compensation and financial restatements, which is part of the fiduciary duty. Restatement firms were significantly more likely to experience turnover of their CFOs than firms with no restatement announcement (Arthaud-Day, Dalton, & Dalton, 2006), which implies that CFOs are held responsible for financial restatements. After financial restatements, boards seem more likely to terminate CFOs after the implementation of SOx in contrast with CEO termination (Burks, 2010).

Moreover, there is evidence that the firm’s emphasis on financial performance measures in CFO bonuses reflects a trade-off between the importance of CFOs’ decision making responsibilities and the importance of their fiduciary duties. Compensation systems tend to change as a result of chance in priority of the CFO responsibility. For instance, they find that public companies have reduced the percentage of CFO bonuses contingent on financial performance during the years 2003 to 2007 in response to the post-SOx increase in the costs of misreporting (Indjejikian & Matêjka, 2009).

Since responding to corporate failures should be strengthening financial reporting, Indjejikian & Matêjka search for an increase in emphasis on the fiduciary duty of the CFO with regard to bonuses. They indeed find evidence in the bonus structure of the CFOs that indicates more emphasis on the fiduciary duty of the CFO in turbulent times of the firm (Indjejikian & Matêjka, 2009).

### 2.3.3 The managerial responsibility

Besides their fiduciary responsibilities, CFOs have to make decisions like any other manager (Indjejikian & Matêjka, 2009). The literature includes many definitions of management, all relate to the processes of organizing resources and directing activities for the purpose of achieving organisational objectives (Merchant & Van der Stede, 2007). Managerial duties include contributing to operational decisions, which affects firm financial performance (Mergenthaler, Rajgopal, & Srinivasan, 2012). Other work shows that CFO managerial duties affect firms’ financial and strategic decisions (Busco, 2005; M. Z. Frank & Goyal, 2007; Wunsche, 2007; Carter, Lynch, & Zechman, 2009; Ge, Matsumoto, & Zhang, 2011; Mergenthaler et al., 2012) and that these duties are reflected in CFO compensation (Gore et al., 2011). While this literature provides an abstract definition of the managerial duty, Hoitash et al. (2011) define the managerial duty as the duty that results in financial performance outcomes, which is also not a very clear definition.

It is clear that literature describes the managerial duty of the CFO only on a very abstract level. This is a logical consequence of the high complexity of the managerial duty, but it makes it hard to be more specific. The complexity includes the fact that CFO’s managerial and fiduciary duty are more or less fused into one task. This makes it difficult to capture the managerial duty with a variable. Indjejikian & Matêjka however, use firm financial performance as a measurement of CFO managerial performance (Hoitash et al., 2012; Indjejikian & Matêjka, 2009).

### 2.3.4 CFO total performance

The CFO managerial and fiduciary responsibility each constitutes a part of the total CFO responsibility. Theoretically, it should be possible to combine those two portions of performance to measure the CFO’s total performance. Empirically, however, it is rather difficult to identify these. The literature provides no measurements that capture a CFO’s total performance. To generate an empirical measurement of CFO total performance for this thesis, the measurement of total CEO performance is discussed. The choice to use CEO performance measures for the CFO performance is a result of the intertwined goals of the two directors. Although they have different priorities and tasks, their main goals and interest do not differ. One could even say that the CEO and CFO have to be aligned and unanimous, as if they act as one entity.

For an overview of the relevant literature regarding the CFO performance, see the tabular summary in the Appendix with concise description of the articles.

#### 2.3.4.1 CEO performance

The CEO is notably the executive in the board of directors whose performance is based on the total firm performance, since he is the head of the board of directors and therefore ultimately responsible.

Regarding the empirical measurement of CEO total performance, several studies implicitly use firm’s stock performance as a proxy of firm performance (Bushman, Indjejikian, & Smith, 1996; Core, Holthausen, & Larcker, 1999). The reasoning is that the CEO is seen as the top director who acts on behalf of the shareholders and therefore his performance is measured according to shareholder value in the form of stock price. As indicated, the main goals of the CEO and CFO come to a large degree of similarity, so also their proxies should be empirical transferrable. When it is assumed that CEO and CFO performance are practically the same, the measurement of CEO and CFO performance should be the same too.

## 2.4 Summary and conclusions

The review of prior research makes clear that the CFO has an important position in the firm, but only few studies examine his tasks separately. No doubt that this is a consequence of the high overlap of the tasks of the CFO, but it contrasts sharply with the amount of literature regarding the various aspects of CEO performance.

The explicit distinction between the two duties of the CFO, managerial and fiduciary duty, is only made in a few studies (Hoitash et al., 2012; Indjejikian & Matêjka, 2009). These studies find evidence for a positive relation between CFO fiduciary performance and CFO compensation. Moreover, in the years after the introduction of SOx, they find results that indicate a decreased emphasis on managerial performance via compensation and thus a relative increase in emphasis on the fiduciary performance as SOx intended to do. This evidence suggests that there is a distinction between fiduciary and managerial duty and it is linked to incentive compensation.

In order to perform his duties and to pursue firm’s goals, the firm constructs a control system for the CFO. This control system should provide the right incentives to act in the best interest of the firm, while performance measurement extrapolates useful information back to the firm. Part of the control system is the stimulation via a compensation incentive system, which often contains monetary compensation. Empirical literature, however, has doubts about this association, arguing that the relation between monetary compensation and performance is not just straightforward as theoretical literature claims.

For CFOs, a frequent form of compensation is equity-based compensation, which includes options and restricted stocks in CFO compensation packages. When the CFO is stimulated via equity, theory argues that he becomes more aligned with company goals, which increases performance. However, researchers fail to agree about the efficiency of equity-based compensation, since their empirical evidence shows mixed results.

For an overview of the relevant literature used in the theoretical framework, see the tabular summary in the Appendix with concise description of the articles.

# 3 Hypotheses

The theoretical review outlines a framework and indicates the position of this thesis within this framework. This chapter presents the conceptual framework and hypotheses that result from the theoretical review and are used to support the main research question. Moreover, it elaborates on the reasoning behind the hypotheses and defines the variables.

## 3.1 Conceptual framework

The conceptual framework in figure 1 exemplifies the relation between the dependent and independent variables. This thesis examines the influence of cash and equity-based compensation on CFO performance, which is preceded by effort and performance measurement.

CFO Responsibilities

Managerial Duties

Performance Measurement

Fiduciary Duties

Performance Measurement

##### Figure 1: Conceptual framework

Fiduciary Performance

CFO Compensation

Managerial Performance

Effort

Effort

## 3.2 Hypothesis development

The typical point of departure is the contract between the CFO and the shareholders. CFOs may not act in the manner desired by the firm’s owners, so incentives should place some weight on the performance measures that provide incremental information about the directions in which the owner wants a performance. The relation this thesis tends to research is the influence of equity-based compensation on CFO’s fiduciary and managerial performance. This relation is examined by means of several hypotheses. These hypotheses are presented in this paragraph even as the Libby boxes that mention the association on conceptual and operational level.

In practice, the fiduciary and managerial tasks of the CFO are intertwined, which makes it difficult to make a distinction when empirically examining this tasks. In addition, the empirical evidence shows that there are only a few studies that explicitly examine the managerial and fiduciary performance (Hoitash et al., 2012; Indjejikian & Matêjka, 2009). This indicates that the CFO performance is complicated to define, but also that there is a gap in the literature, that provides for empirically addressing this issue. This thesis focuses thus on both fiduciary and managerial responsibility and performance, and makes an explicit distinction between them.

CFO fiduciary and managerial performance are measureable and are captured in a variable by previous research (Hoitash et al., 2012; Indjejikian & Matêjka, 2009). Results of Hoitash et al. (2012) indicate that CFO bonuses are negatively related with CFO fiduciary performance and Indjejikian & Matêjka (2009) show that firms adjust their incentive schemes to emphasize fiduciary performance. This thesis focuses on CFO fiduciary and managerial performance as a part of CFO total performance and the association between incentive compensation in the form of equity-based compensation. According to the literature, the performance on the fiduciary duty and managerial duty should add up to CFO’s total performance (Indjejikian & Matêjka, 2009). This implicates that equity-based incentives on fiduciary or managerial performance impact the CFO’s total performance.

Overall, literature provides ambiguity regarding the association between equity-based compensation and executive performance. While theoretical and mathematical models indicate that equity-based compensation increases goal alignment of the executive and the firm (e.g. Grossman & Hart, 1986; Harris & Raviv, 1979; Hölmstrom, 1979; Jensen & Murphy, 1990), empirical studies show several objections to this association (e.g. Armstrong et al., 2013; Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Cheng & Warfield, 2005; Cheng & Farber, 2008).

### 3.2.1 Hypothesis 1

The first hypotheses distinguish managerial and fiduciary duty and use the theoretical prediction that equity-based compensation is effective (e.g. Hölmstrom, 1979; Mehran, 1995). The following hypotheses are constructed to support the main research question:

*H1a: Equity-based compensated CFOs perform better on managerial responsibilities than CFOs who are not equity-based compensated*

*H1b: Equity-based compensated CFOs perform better on fiduciary responsibilities than CFOs who are not equity-based compensated*

#### 3.2.1.1 Libby boxes

The Libby boxes presented in figure 2 show the construct of the relation indicated in hypotheses 1a and 1b on conceptual level and operational level (Libby, 1981).

Conceptual X

- CFO equity-based compensation

Conceptual Y

- CFO managerial performance (H1a)

- CFO fiduciary performance (H1b)

Operational X

- Presence of equity-based compensation in compensation package

Operational Y

- Firm financial performance (H1a)

- Disclosure of ICMW (H1b)

- Restatement (H1b)

Conceptual Z

- Size of firm

Operational Z

- Revenue

##### Figure 2: Libby boxes hypothesis 1

### 3.2.2 Hypothesis 2

Researchers fail to agree on the effectiveness of equity-based compensation at different levels. Some provide evidence that equity based compensation is ineffective at all (Jenkins Jr, 1986; Jenkins Jr et al., 1998) or has even contrary effects (Kohn, 1993), while others argue that equity-based compensation is effective up to a certain level (Paul, 1992; Sloan, 1993). The second hypothesis distinguishes the managerial and fiduciary duty and also examines the effectiveness of the proportion of equity-based compensation of the total compensation. The following hypotheses are constructed to support the main research question:

*H2a: Equity compensation increases the CFO managerial performance only until a certain level of in the proportion of equity-based compensation to total compensation*

*H2b: Equity compensation increases the CFO fiduciary performance only until a certain level of in the proportion of equity-based compensation to total compensation*

#### 3.2.2.1 Libby boxes

The Libby boxes presented in figure 3 show the construct of the relation indicated in hypotheses 2a and 2b on conceptual level and operational level (Libby, 1981).

Conceptual X

- Proportion CFO equity-based compensation

Conceptual Y

- CFO managerial performance (H2a)

- CFO fiduciary performance (H2b)

Operational X

- Proportion equity-based compensation of total compensation

Operational Y

- Firm financial performance (H2a)

- Disclosure of ICMW (H2b)

- Restatement (H2b)

Conceptual Z

- Size of firm

Operational Z

- Revenue

##### Figure 3: Libby boxes hypothesis 2

### 3.2.3 Hypothesis 3

According to the theoretical approach of the two CFO duties (Hoitash et al., 2012; Indjejikian & Matêjka, 2009), CFO managerial and fiduciary performance should add up to CFO total performance. This means that the managerial or fiduciary performance and total performance are not only related, but directly linked to each other. The following hypothesis is constructed to support the main research question:

*H3: Managerial and fiduciary performance of the CFO are positively related to CFO’s total performance*

#### 3.2.3.1 Libby boxes

The Libby boxes presented in figure 4 show the construct of the relation indicated in hypothesis 3 on conceptual level and operational level (Libby, 1981).

Conceptual X

- CFO managerial performance

- CFO fiduciary performance

Conceptual Y

- CFO total performance

Operational X

- Firm financial performance

- Disclosure of ICMW

- Restatement

Operational Y

- Stock price performance

Conceptual Z

- Size of firm

Operational Z

- Revenue

##### Figure 4: Libby boxes hypothesis 3

### 3.2.4 Hypothesis 4

The two CFO duties together are considered to be CFO’s total performance. This implicates that the relation between each duty and equity-based compensation should also be visible when the two duties are assembled. According to the literature (Hölmstrom, 1979; Mehran, 1995), equity-based compensation in the compensation package should have its effects on the CFO’s total performance. Therefore, the dissension regarding the effectiveness of equity in CFO’s compensation package is addressed by examining different proportions of equity-based compensation. The following hypothesis is constructed to support the main research question:

*H4: Equity compensation increases the CFO total performance only until a certain level of in the proportion of equity-based compensation to total compensation*

#### 3.2.4.1 Libby boxes

The Libby boxes presented in figure 5 show the construct of the relation indicated in hypothesis 4 on conceptual level and operational level (Libby, 1981).

Conceptual X

- Proportion CFO equity-based compensation

Conceptual Y

- CFO total performance

Operational X

- Proportion equity-based compensation of total compensation

Operational Y

- Stock price performance

Conceptual Z

- Size of firm

Operational Z

- Revenue

##### Figure 5: Libby boxes hypothesis 4

## 3.3 Measurement of variables

While the Libby boxes only mention the different operational variables, this paragraph discusses the literature regarding measurement of the concepts in order to suffice internal validity, external validity and construct validity as explained in the previous paragraph.

A few studies explicitly measure the CFO’s fiduciary performance (Hoitash et al., 2012; Indjejikian & Matêjka, 2009), while Indjejikian & Matêjka (2009) measures fiduciary performance as the residue of the total performance minus the managerial performance. Hoitash et al. (2012) measure fiduciary performance as the disclosure of an material negative event and use the disclosure of an internal control material weakness. Other studies that implicitly measure the CFO fiduciary performance use restatements (e.g. Arthaud-Day et al., 2006; Burks, 2010) or discretionary accruals (Geiger & North, 2006). This thesis uses the disclosure of an internal control material weakness and restatement as parameters for the CFO’s fiduciary performance.

As already mentioned, Indjejikian & Matêjka (2009) measure CFO’s managerial performance by the firm financial performance. This is the only study that tries to capture the CFO’s managerial performance, and thus this thesis also uses the firm financial performance as a parameter for managerial performance.

The total CFO performance is a concept that has not been measured in previous research. This thesis considers the total CFO performance as the sum of fiduciary performance and managerial performance, as prior work suggests (Indjejikian & Matêjka, 2009). Total CFO performance is measured by the company’s share price performance in the same fiscal year as the CFO compensation is about. This choice is made because of the lack of other measures, and the high cohesion of CFO goals with CEO goals. Since the literature (Bushman et al., 1996; Core et al., 1999) often evaluates CEO performance on the basis of share price performance, this measurement is applied with regard to CFO performance.

The variables regarding equity compensation are based on the amount of stocks, stock options, and restricted stocks that are payed to the CFO in relation to a fiscal year. The cash compensation variables are based on the amount of cash compensation that is payed to the CFO in relation to a fiscal year.

## 3.4 Internal validity, external validity and construct validity

The theory started with series of undefined abstract concepts. Then, the previous paragraphs describe several hypotheses, which are used to examine the research question. Subsequently, the Libby boxes graphically indicate the choice for variables that operationalize the concepts. The choice for variables that capture the concepts is a trade-off between reliability and construct validity on the one hand and between internal validity and external validity on the other(Smith, 2014). Reliability and construct validity is the common thread in this thesis. “*The degree to which inferences can legitimately be made from the operationalisations in this thesis to the theoretical constructs on which those operationalisations were based”* (Trochim, 2006).

The construction of a theoretical framework and the choice of operational variables results in a certain degree of internal validity. This is the certainty of knowing what is causing what because we are aware of and in control of other influential factors. Good theory, valid choice of variables and control variables should address this issue. The theoretical framework in paragraph 3.1 is the conceptual start, which is extended by the measurement of variables in paragraph 3.2.4.

External validity on the other hand, include the generalizability of the results to the real world. This manifests itself in the ways samples represent real world conditions. Paragraph 4.3 elaborates on the sampling of this thesis.

# 4 Methodology

The previous chapters explained the position of this thesis in the theoretical framework. This chapter provides information regarding the data collection, and discusses the methods for the analysis in order to explain how the research is computed. The research is a statistical analysis on archival data and thus quantitative in nature, since the parameters are expressed in numbers.

## 4.1 Data collection

The datasets needed for this thesis are the Audit Analytics (Armstrong et al., 2013) and ExecuComp (Armstrong et al., 2013) database, which are both provided by the Wharton Research Data Service. The Audit Analytics database consist of detailed audit information on over 1200 accounting firms and 15000 publicly registered companies. The ExecuComp database offers executive compensation data including current and historical data, total compensation, executive options and compensation of industry peers. These databases are accessible via the Erasmus Data Service Centre in the library of the Erasmus University Rotterdam or via Virtual Private Network connection. The useful data of the two databases were linked and put together in one new database for this thesis.

## 4.2 Variables

The concepts that are described in the previous chapter are expressed in variables, in order to capture the concept in a metric format and use it for analysis on an operational level. This paragraph explains how the concepts are constructed into variables and how these variables are measured.

The dependent variable of the first hypothesis are the CFO managerial and fiduciary performance. The managerial performance is measured by the firm’s financial performance as in the studies of Indjejikian & Matêjka (2009) and Hoitash et al. (2012). The fiduciary performance is measured in two ways: financial restatement and disclosure of material weakness. These two dependent variables indicate the CFO fiduciary performance in a certain year. A financial restatement of a firm in a certain year is constructed as dummy variable, which is equal to 1 if the firm restates the financial report or 0 when the firm does not restate (Arthaud-Day et al., 2006). The disclosure of an internal control material weakness is constructed as dummy variable, which is equal to 1 if the firm reports a material weakness in its Section 404 report or in at least one of its Section 302 reports in a certain year (Hoitash et al., 2012).

The construct of dependent variables for hypothesis 1 also applies to the dependent variables of hypothesis 2.

For the third hypothesis, total CFO performance is the dependent variable, measured by the company’s share price performance over a fiscal year. This is measured according to the following formula:

In addition, account is taken of outliers by eliminating the stock performances which are over 1500% increase or decrease.

The construct of the dependent variable for hypothesis 3 also applies to the dependent variable of hypothesis 4.

The first independent variable is dummy variable of equity compensation, that indicates the presence of equity-based compensation in the CFO compensation package. If the equity compensation is larger than 0, the CFO is compensated with equity and the dummy variable is equal to 1. When the variable is equal to 0, the CFO is not compensated with equity and the dummy variable is equal to 0.

The second independent variable is the proportion of equity, that measures the proportion of equity-based compensation in a certain year according to the following formula:

After measuring the proportion, the proportion is classified in a decile between 0 and 1, the higher the decile, the more compensation is equity-based. The concerned compensation is coded as a number from 1 to 10 for the decile it is classified to. In this way, the variable captures the various proportions of equity compensation.

The third dependent variable is the measure for managerial and fiduciary performance, which are used as an dependent variables for hypothesis 1 and 2. The same approach holds for hypothesis 3, but then considered as an independent variable.

For hypothesis 4, the variable of equity proportion is used as an independent variable, which is used in hypothesis 2 as well. The same approach holds for hypothesis 4.

Control variables are needed to generate a valid capture of an effect by keeping other influences, that are not in the scope of the analysis, constant. The revenue of a company is added to measure the size of a firm, and capturing differences in size (Indjejikian & Matêjka, 2009).

See table 1 and 2 for an overview of the dependent and independent variables.

##### Table 1: Dependent variables

|  |  |  |
| --- | --- | --- |
| **Variable** | **Proxy** | **Definition** |
| Firm financial performance | CFO performance on managerial duty | The earnings of a firm in a certain fiscal year |
| Internal control material weakness | CFO performance on fiduciary duty | The disclosure of at least 1 internal control material weakness |
| Restatement | CFO performance on fiduciary duty | Financial accounting restatement |
| Stock price performance | CFO total performance | Stock price performance over 1 fiscal year |
| Equity compensation | Presence of equity compensation | The presence of equity-based compensation in the compensation package of the CFO |
| Equity compensation | CFO equity compensation | Amount of equity compensation of CFO |
| Cash compensation | CFO equity compensation | Amount of cash compensation of CFO |

##### Table 2: Independent variables

|  |  |  |
| --- | --- | --- |
| **Variable** | **Proxy** | **Definition** |
| Equity compensation | Presence of equity compensation | The presence of equity-based compensation in the compensation package of the CFO |
| Firm financial performance | CFO performance on managerial duty | The yearly earnings of a firm in a certain fiscal year |
| Internal control material weakness | CFO performance on fiduciary duty | The disclosure of at least 1 internal control material weakness |
| Restatement | CFO performance on fiduciary duty | Financial accounting restatement |
| Proportion Equity | Proportion of equity based compensation | The proportion equity of total compensation |

## 4.3 Sample

The Audit Analytics data consists of firms that are registered by the United States Securities and Exchange Commission since 2000. A total of 77489 unique records are initially subtracted from this database. The ExecuComp database consist of CFO compensation data of S&P 1500 firms since 1992. Initially, 15938 records are subtracted from this database. However, only the data of the two databases that can be linked is included in the sample. This results in an initial dataset of 15936 records of 2314 unique firms during the years 2006 to 2014. The several hypotheses have different sample sizes, since some hypotheses use more variables and faced incomplete records that are excluded. Tables 3,4,5, and 6 show the composition of the samples per hypothesis.

##### Table 3: Subsamples hypothesis 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hypothesis 1** | | | | | | | |
| **Hypothesis** | **Total records** | **X Variable subtotals** | | **Y Variable subtotals** | | **Unique firms** | **Years** |
| 1a | 8303 | Equity-Compensated | 7613 | Financial performances | 8303 | 1223 | 2006-2014 |
| Not Equity-Compensated | 690 |
| 1b | 15936 | Equity-Compensated | 14389 | ICMWs | 2662 | 2314 | 2006-2014 |
| Not Equity-Compensated | 1547 | 268 |
| 15936 | Equity-Compensated | 14389 | Restatements | 704 | 2314 | 2006-2014 |
| Not Equity-Compensated | 1547 | 77 |

##### Table 4: Subsamples hypothesis 2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hypothesis 2** | | | | | | | |
| **Hypothesis** | **Total records** | **X Variable subtotal: deciles** | | **Y Variable subtotals** | | **Unique firms** | **Years** |
| 2a | 8319 | 0% - 10% Equity | 749 | Financial performances | 8319 | 1233 | 2006-2014 |
| 10% - 20% Equity | 310 |
| 20% - 30% Equity | 410 |
| 30% - 40% Equity | 485 |
| 40% - 50% Equity | 590 |
| 50% - 60% Equity | 646 |
| 60% - 70% Equity | 763 |
| 70% - 80% Equity | 860 |
| 80% - 90% Equity | 764 |
| 90% - 100% Equity | 2742 |
| 2b | 15504 | 0% - 10% Equity | 1530 | ICMWs | 270 | 2308 | 2006-2014 |
| 10% - 20% Equity | 551 | 97 |
| 20% - 30% Equity | 772 | 129 |
| 30% - 40% Equity | 933 | 152 |
| 40% - 50% Equity | 1086 | 189 |
| 50% - 60% Equity | 1238 | 211 |
| 60% - 70% Equity | 1409 | 281 |
| 70% - 80% Equity | 1583 | 289 |
| 80% - 90% Equity | 1388 | 259 |
| 90% - 100% Equity | 5014 | 988 |
| 15936 | 0% - 10% Equity | 1530 | Restatements | 81 | 2314 | 2006-2014 |
| 10% - 20% Equity | 551 | 30 |
| 20% - 30% Equity | 772 | 48 |
| 30% - 40% Equity | 933 | 38 |
| 40% - 50% Equity | 1086 | 53 |
| 50% - 60% Equity | 1238 | 72 |
| 60% - 70% Equity | 1409 | 79 |
| 70% - 80% Equity | 1583 | 71 |
| 80% - 90% Equity | 1388 | 66 |
| 90% - 100% Equity | 5014 | 219 |

##### Table 5: Subsamples hypothesis 4

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hypothesis 3** | | | | | | | |
| **Hypothesis** | **Total records** | **X Variable subtotal** | | **Y Variable subtotal** | | **Unique firms** | **Years** |
| 3 | 5064 | Financial performances | 5064 | Stock performance | 5064 | 1034 | 2006-2014 |
| ICMWs | 482 |
| Restatements | 384 |

##### Table 6: Subsamples hypothesis 5

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hypothesis 4** | | | | | | | |
| **Hypothesis** | **Total records** | **X Variable subtotal** | | **Y Variable subtotal** | | **Unique firms** | **Years** |
| 4 | 4950 | 0% - 10% Equity | 452 | Stock performance | 4950 | 1036 | 2006-2014 |
| 10% - 20% Equity | 191 |
| 20% - 30% Equity | 222 |
| 30% - 40% Equity | 296 |
| 40% - 50% Equity | 373 |
| 50% - 60% Equity | 402 |
| 60% - 70% Equity | 438 |
| 70% - 80% Equity | 507 |
| 80% - 90% Equity | 480 |
| 90% - 100% Equity | 1589 |

## 4.4 Testing the hypotheses

This paragraph explains the statistical approach of the hypotheses.

### 4.4.1 Testing hypothesis 1

Hypothesis 1 predicts that equity-based compensated CFOs do better on managerial and fiduciary performance than CFOs who are not equity-based compensated. This hypothesis is tested by an Independent T-test, which compares two groups on the same moment. This is computed according to the following formula where “Avg” is average of the performance, “S” is variance, and “n” is number of performances. This T-test is computed for each of the measures of performance, which means it generates a T-value for FIN PERF, ICMW and REST. The T-value is tested against a 5% confidence level and calculated according the following formula.

### 4.4.2 Testing hypothesis 2

Hypothesis 2 predicts that fiduciary and managerial performance differs per proportion of equity-based compensation, which is tested by an one-way ANOVA F-test. This test compares the ten deciles in the degree of the proportion equity compensation. The formula is as follows, where “n” is the number of observations per decile, “x” is the average performance of the decile, “x” is the average performance of all the deciles, “S” is de variance of the decile, “N” is the total number of observations. For each performance measure FIN PERF, ICMW and REST, an ANOVA test is computed. The F-value is tested against a 5% confidence level and calculated according to the following formula:

### 4.4.3 Testing hypothesis 3

Hypothesis 3 predicts a positive relation between CFO managerial or fiduciary performance and CFO total performance. This association is tested by an Ordinary Least Squares regression to examine the coefficients of the variables. The independent variables FIN PERF, ICMW and REST are tested against dependent variable of total performance. Moreover, the control variable is added to control for firm size effects. The OLS regression is stated as follows:

### 4.4.4 Testing hypothesis 4

Hypothesis 4 predicts that CFO total performance differs per proportion of equity-based compensation which is tested by an one-way ANOVA F-test. This test compares the ten deciles in the degree of the proportion equity compensation. The formula is as follows, where “n” is the number of observations per decile, “x” is the average total performance of the decile, “x” is the average total performance of all the deciles, “S” is de variance of the decile, “N” is the total number of observations. The F-value is tested against a 5% confidence level and calculated according to the following formula:

# **5 Results**

The outcomes of the statistical tests are discussed in this chapter. This leads to an interpretation with regard to the acceptation or rejection of all the hypotheses. Eventually, an overview of the expected outcomes and actual outcomes per hypothesis is provided.

The first hypothesis examines the presence of equity based compensation in a CFO compensation contract and the managerial and fiduciary performance. The statistical results regarding hypothesis 1 are presented in table 7. Since the Levene’s Test for equality of variances is significant, the variances of errors are not equal for both groups. Therefore, a wider confidence interval is used with the result that the CFOs with equity in their compensation package generate a significantly better financial performance than CFOs without equity in their compensation package.

With regard to the fiduciary duty, the first hypothesis is tested on both ICMWs and financial restatements. Table 7 shows the results of the statistical test performed with the ICMWs and indicates the inequality of variances and no significant difference regarding ICMWs between the equity compensated CFOs and the CFOs that were not equity compensated. Moreover, it appears that there is no significant difference between equity compensated CFOs and non-equity compensated CFOs with regard to financial restatements.

##### Table 7: Association between presence of equity based compensation and managerial and fiduciary performance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Equity Compensated? | N | Mean | Std. Dev. | Levene´s | p-value |
| FIN PERF | Yes | 7613 | 5,41 | 6,05 | 0,000  (121,424) | 0,000  (-7,147) |
| No | 690 | 3,45 | 6,99 |
| ICMW | Yes | 14389 | 0,19 | 3,88 | 0,021  (5,309) | 0,247  (-1,158) |
| No | 1547 | 0,17 | 3,79 |
| REST | Yes | 14389 | 0,05 | 0,218 | 0,769  (0,086) | 0,883  (0,147) |
| No | 1547 | 0,05 | 0,216 |

The second hypothesis splits the equity compensation in ten different deciles, based on the proportion of equity in the compensation package. The outcomes of these tests are presented in table 8. Although the variances of the deciles are heterogenetic, the one-way ANOVA shows a highly significant value, which indicates that not all the means of the deciles are equal. Figure 6 shows the increase of firm’s financial performance as a function of the equity compensation, which mentions a positive relation between CFO managerial performance and equity compensation. The comprehensive statistical output in the appendix provides evidence that the mean of most of the deciles are significantly different. The only insignificant differences occur for the means between the adjacent deciles.

With regard to ICMW, table 4 shows a significant Levene’s statistic, so equality of variances is not assumed. The ANOVA results in a non-significant p-value, which means that there is no significant difference between the different proportions in the relation to fiduciary performance. Figure 7 visualizes this insignificant relation.

For the financial restatements, Leven’s statistic is significant, so equality of variances is not assumed. The p-value of the ANOVA is not significant, which means that there is no difference in financial restatement for different proportion of equity compensation. Figure 8 visualizes the non-significant association between the proportion of equity compensation and financial restatements. See the multiple comparisons in the Appendix for more insights in the mutual relation between the deciles.

##### Table 8: Association between the proportion of equity based compensation and managerial and fiduciary performance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Equity Proportion | N | Mean | Std. Dev. | Levene´s | p-value |
| Firm’s financial performance | 0% - 10% Equity | 749 | 3,26 | 6,9963 | 0,000  (27,494) | 0,000  (18,008) |
| 10% - 20% Equity | 310 | 4,07 | 6,3805 |
| 20% - 30% Equity | 410 | 4,26 | 6,3656 |
| 30% - 40% Equity | 485 | 4,86 | 6,0491 |
| 40% - 50% Equity | 590 | 4,82 | 6,3163 |
| 50% - 60% Equity | 646 | 5,73 | 5,6869 |
| 60% - 70% Equity | 763 | 5,52 | 6,0242 |
| 70% - 80% Equity | 860 | 5,93 | 5,9140 |
| 80% - 90% Equity | 764 | 6,54 | 5,5974 |
| 90% - 100% Equity | 2742 | 5,51 | 6,0235 |
| ICMW | 0% - 10% Equity | 1530 | 0,176 | 0,3813 | 0,000  (6,824) | 0,086  (1,686) |
| 10% - 20% Equity | 551 | 0,176 | 0,3812 |
| 20% - 30% Equity | 772 | 0,167 | 0,3733 |
| 30% - 40% Equity | 933 | 0,163 | 0,3695 |
| 40% - 50% Equity | 1086 | 0,174 | 0,3793 |
| 50% - 60% Equity | 1238 | 0,170 | 0,3762 |
| 60% - 70% Equity | 1409 | 0,199 | 0,3997 |
| 70% - 80% Equity | 1583 | 0,183 | 0,3864 |
| 80% - 90% Equity | 1388 | 0,187 | 0,3897 |
| 90% - 100% Equity | 5014 | 0,197 | 0,3978 |
| Restatement | 0% - 10% Equity | 1530 | 0,06 | 0,232 | 0,000  (6,193 | 0,123  (1,555) |
| 10% - 20% Equity | 551 | 0,05 | 0,227 |
| 20% - 30% Equity | 772 | 0,06 | 0,242 |
| 30% - 40% Equity | 933 | 0,04 | 0,198 |
| 40% - 50% Equity | 1086 | 0,05 | 0,216 |
| 50% - 60% Equity | 1238 | 0,06 | 0,234 |
| 60% - 70% Equity | 1409 | 0,06 | 0,230 |
| 70% - 80% Equity | 1583 | 0,04 | 0,207 |
| 80% - 90% Equity | 1388 | 0,05 | 0,213 |
| 90% - 100% Equity | 5014 | 0,04 | 0,216 |

##### Figure 7: the effect of equity compensation on fiduciary performance measured by ICMW disclosure.

##### Figure 6: the effect of equity compensation on firm's managerial performance measured by firm’s financial performance.

##### Figure 8: the effect of equity compensation on fiduciary performance measured by financial restatements.

To test hypothesis 3, a regression is performed. The results are presented in table 9. None of the p-values is significant, except for the control variable for firm size. This implicates that managerial performance and fiduciary performance are not associated with total CFO performance.

##### Table 9: Association between CFO’s managerial, fiduciary and total performance

|  |  |  |  |
| --- | --- | --- | --- |
| Dependent variable: stock performance | | | |
|  | Unstandardized coefficients | |  |
| Coefficient | Std. Error | p-value |
| Constant | -0,210 | 0,164 | 0,200  (-1,281) |
| Financial performance | -0,002 | 0,002 | 0,503  (-0,670) |
| ICMW | -0,042 | 0,053 | 0,431  (-0,788) |
| Restatement | 0,074 | 0,048 | 0,122  (1,546) |
| Revenue | 0,040 | 0,018 | 0,026  (2,222) |
| R ²= 0,002 | | | |
| Adjusted R² = 0,001 | | | |

The final hypothesis tests whether different proportions of equity compensation have different influences on CFO’s total performance. As is stated in table 10, the ANOVA is not significant, therefore the different deciles do not have different influences on CFO’s total performance. In the Appendix, a more specific table is provided to explain the mutual differences between the deciles. Figure 4 shows the insignificant association between the equity proportion and stock performance.

##### Table 10: Association between proportion of equity based compensation and CFO’s total performance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Equity Proportion | N | Mean | Std. Dev. | Levene´s | p-value |
| Total performance | 0% - 10% Equity | 452 | 0,186 | 1,236 | 0,015  (2,287) | 0,271  (1,230) |
| 10% - 20% Equity | 191 | 0,109 | 0,758 |
| 20% - 30% Equity | 222 | 0,197 | 1,194 |
| 30% - 40% Equity | 296 | 0,104 | 0,639 |
| 40% - 50% Equity | 373 | 0,101 | 0,611 |
| 50% - 60% Equity | 402 | 0,185 | 0,800 |
| 60% - 70% Equity | 438 | 0,101 | 0,619 |
| 70% - 80% Equity | 507 | 0,154 | 0,903 |
| 80% - 90% Equity | 480 | 0,204 | 0,730 |
| 90% - 100% Equity | 1589 | 0,158 | 1,211 |

##### Figure 9: the effect of equity compensation on CFO's total performance measured by stock performance.

In table 11, the predicted and actual outcomes of the hypotheses are presented. Only the hypotheses regarding the managerial performance turn out to be highly significant with the predicted sign. All the other hypothesis are not highly significant or not significant at all.

##### Table 11: Overview of predicted and actual outcomes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hypothesis | Independent variable | Dependent variable | Predicted sign | Coefficient |
| 1a | Equity compensation | Managerial performance | + | +\*\*\* |
| 1b1 | Equity compensation | Fiduciary performance | + | + |
| 1b2 | Equity compensation | Fiduciary performance | + | +/- |
| 2a | Equity proportion | Managerial performance | + | +\*\*\* |
| 2b1 | Equity proportion | Fiduciary performance | + | +\* |
| 2b2 | Equity proportion | Fiduciary performance | + | +/- |
| 3 | Managerial performance  Fiduciary performance (ICMWs)  Fiduciary performance (Restatements) | Total performance | +  -  - | -  -  + |
| 4 | Equity proportion | Total performance | + | +/- |

# **6 Conclusion**

This chapter draws a conclusion on the basis of the rejection or acceptance of the hypotheses and discusses these outcomes in combination with the practical implications. Subsequently, the limitations and the directions for future research are considered.

## **6.1 Discussion**

The outcomes of the statistical tests prove that CFOs perform better on their managerial duty when there is any form of equity in their compensation package. This is in line with the theoretical and mathematical models (e.g. Grossman & Hart, 1986; Hölmstrom, 1979; Jensen & Murphy, 1990) as well as empirical evidence (Mehran, 1995), which indicates that equity-based compensation increases goal alignment of the executive and the firm. Moreover, the results of this thesis show a positive relation between the proportion of equity compensation and the managerial performance. These findings indicate that equity compensation is effective. However, in contrast to the managerial performance, there is no difference in fiduciary performance for CFOs that are equity compensated. This undermines the effectivity of equity compensation and refutes the studies of Grossman & Hart (1986), Hölmstrom (1979) and Jensen & Murphy (1990). Although the findings do not support these pro-equity studies with respect to the fiduciary duty, the opponents of equity compensation (e.g. Armstrong et al., 2013; Bergstresser & Philippon, 2006; Cheng & Warfield, 2005; Cheng & Farber, 2008) are not supported either. Fiduciary performance is not influenced by equity compensation at all, which matches with only the findings of Amstrong et al. (2010) who found no relation between equity-based compensation and accounting irregularities.

In prior research (Hoitash et al., 2012; Indjejikian & Matêjka, 2009), the CFO total duty was considered as the sum of CFO’s managerial duty and his fiduciary duty. Indjejikian & Matêjka (2009) interpreted the decreased weight on financial performance since the introduction of SOx as way to increase attention on quality of financial reporting. The results of this thesis show that the interpretation of Indjejikian and Matêjka might be invalid. By performing a regression, this thesis indicates that CFO’s total performance is not associated with either his managerial performance or his fiduciary performance. This result contravenes the underlying assumption that the CFO’s performance is based on these two duties. The reason for this unexpected outcome may have a methodological cause, since the total CFO performance is considered as an equivalent of total CEO performance, which is considered as the stock performance. While there are reasonable arguments to assume that this theoretical link is valid in practice, several studies disagree (Paul, 1992; Sloan, 1993). Where Indjejikian & Matêjka (2009) use a survey and Hoitash et al. (2012) a regression, they do not construct a variable for measuring the CFO total performance as a whole, but only measure sub-performance and then interpret the total performance based on a theoretical assumption.

## 6.2 Practical implications

The practical implications of this study are divided in three parts. The results of this study provide new insights in the trend to strengthen financial reporting and governance practices. Secondly, this thesis improves the translation to the practice of the theoretical construct of CFO performance, in the form of managerial and fiduciary performance. Thirdly, the results of this thesis contribute to the discussion with regard to equity compensation as a form of incentive in a principal-agent setting.

Recent regulations have been aimed at strengthening financial reporting and governance practices such as executive compensation by, for instance, the introduction of SOx. This thesis provides useful practical implications for optimal incentive tuning in order to increase the attention on firm’s reporting quality and reduce the weight on solely financial performance (Indjejikian & Matêjka, 2009). This thesis shows an association between CFO’s equity-based incentives and firm’s financial performance, but no relation between CFO’s equity-based incentives and firm’s fiduciary performance. This means that all the equity-based compensation that is used to stimulate managerial performance of the CFO is effective. However, compensation used to stimulate the fiduciary performance of the CFO, is highly ineffective. Apparently, in contrast to the intention of SOx, firms still weigh financial performance more heavily than stronger financial reporting. In order to achieve financial reporting of a higher quality, firms should come up with other incentives schemes than equity-based compensation, because that has no effect on the reporting quality of the firm.

This thesis provides practical insight in the approach, construct, specification and measurement of CFO performance. Very little studies (Hoitash et al., 2012; Indjejikian & Matêjka, 2009) tried to divide the performance of a CFO into his managerial duties and fiduciary duties. The comprehensive tasks of a CFO are intertwined and complex to capture in variables. This thesis demonstrates that the CFO’s managerial and fiduciary performance are not associated with the firm’s stock price, which is a development in the construction of measures for CFO performance.

Another outcome of this thesis is the contribution to the discussion regarding equity compensation as a form of incentive for top executives such as the CFO. While the literature review showed mixed results (e.g. Burns & Kedia, 2006; Grossman & Hart, 1986; Hölmstrom, 1979; Mehran, 1995; Paul, 1992; Sloan, 1993), this thesis indicated a clear positive relation between the proportion of equity in the compensation package and the financial performance of a firm. The board of directors, who normally construct the incentive system for top executives on behalf of the shareholders, can learn from this. In this typical principal-agent setting, tying the agent’s compensation to the performance of the principal seems to be effective.

## 6.3 Limitations

This thesis examines the association between equity compensation and the CFO’s managerial and fiduciary performance. It aims to provide more insight in performance measurement of the CFO in relation to compensation incentives. The interpretation of the results is subject to several limitations.

This study uses several variables regarding CFO managerial, fiduciary and total performance. These performances are all matched to the compensation of the CFO in that particular year. Firstly, this assumes that the compensation in a certain year is directly linked to the performance of that exact same year. However, performance can be influenced by incentives in the previous or next years. This creates mismatching problems with regard to timeliness. Secondly, linking performance to compensation results in the assemble of two databases, leads to a considerable amount of incomplete and unusable data, which causes convenience sampling.

Because of its high complexity, the performance of a CFO is difficult to capture in variables and roles and task may vary. The variables used in this study are considered to be comprehensive and measure the total performance, managerial performance or fiduciary performance. However, these variables are only an attempt to capture the concepts and are just an approximation in practice. In addition, there are potentially correlated omitted variables that are not mentioned in the analyses. The only way this thesis addresses this issue is by constructing a control variable for firm size. Because of the use of databases, other potential control variables were not provided.

The link between incentives and performance implicitly means that this thesis views this relation as compensation influencing performance, but not vice versa. This possible reversed relation would mean that performance influences compensation, which is not unimaginable. Moreover, the current approach only takes into account the monetary compensation as a form of rewarding. However, there are many other ways to express a reward such as titles, job security, autonomy, power, opportunities and promotions. Besides, negative rewards are only briefly mentioned, but not actually taken into account. Negative rewards, or punishments, mostly do not have a financial consequence, but are present in the form of resignation, zero salary increase, demotion or public humiliation (Merchant & Van der Stede, 2007). As the conceptual framework in figure 1 mentions, the link between compensation and performance is affected by effort and performance measurement. This thesis does not account for these intermediate steps and thus assumes that these steps cause no noise on the link between compensation and performance. In fact, this assumption is questionable, since effort and performance measurement are two highly complex variables that in all probability cause noise on the clear theoretical link.

An assumption within the theoretical framework is the implicit choice of maximisation of shareholder value as a firm’s goal. This typical Anglo-Saxon approach is increasingly being replaced by a more Rhineland oriented view, where the vision of an organisation has to take into account other stakeholders.

Concerning the principal-agent setting and optimisation of the incentives for the agent, this thesis might be short-sighted when it assumes that performance is a hundred percent function of motivation. For an agent’s performance, other factors are important too, such as his the direction of his motivation and his abilities. A maximum motivation does not solve a lack of direction or a lack of abilities. This thesis supposes that all the principals pick their agent and after that, they only should motivate him. Although one does not become a CFO out of nowhere, the question remains whether the CFO meets the qualitative requirements to pursue firm goals.

This thesis tries to provide clarity in the discussion regarding equity compensation as compensation method. The positive relation between equity compensation and CFO managerial performance is evident, but the insignificant association between equity compensation and CFO fiduciary performance is inexplicable. While this thesis proves the influence of equity compensation on the one hand, it makes the discussion regarding equity compensation even more complicated on the other hand.

## 6.4 Future research

The new insights and shortcomings of this study raise some interesting questions for future research.

First of all, it would be interesting to repeat this study with more data or more complete data. The two databases that are used, are not perfectly compatible, which results in a large amount of incomplete and unusable data. By using more data, a higher external validity could be achieved. Moreover, the databases did not offer the possibility to use any control variables, except for the size control variable. When more control variables are used, it would reduce the chance on a omitted correlating variable and increases the internal validity.

An interesting focus for future research could be to address the possible reversed relation problem, but this would require more information with regard to the compensation contract. This also touches the timing problem of tying the right performance to the right incentive.

While this study finds no evidence that the managerial performance and fiduciary performance are related to the CFO’s total performance, this relation can be investigated more intensively. A revision of the methodological construct, with the proxies in particular, should lead to an expansion of the theoretical framework. Reviewing the CFO performance with other variables would provide more practical insights for CFO performance measurement.

In line with of several prior studies (Armstrong et al., 2013; Grossman & Hart, 1986; e.g. Harris & Raviv, 1979; Hölmstrom, 1979), this study did not come up with consistent findings concerning the effectivity of equity based compensation. While there are clear indications that equity based compensation is an effective method for board of directors to motivate executives, this study cannot formulate the construct of the association, which means that this subject definitely needs more attention.

7 References

107th congress public law 204, 107-204, 107th CongressCong. (2002).

Abernethy, M. A., Bouwens, J., & van Lent, L. (2004). Determinants of control system design in divisionalized firms. *The Accounting Review, 79*(3), 545-570. doi:10.2308/accr.2004.79.3.545

Armstrong, C. S., Jagolinzer, A. D., & Larcker, D. F. (2010). Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research, 48*(2), 225-271.

Armstrong, C. S., Larcker, D. F., Ormazabal, G., & Taylor, D. J. (2013). The relation between equity incentives and misreporting: The role of risk-taking incentives. *Journal of Financial Economics, 109*(2), 327-350.

Arthaud-Day, M. L., Dalton, C. M., & Dalton, D. R. (2006). A changing of the guard: Executive and director turnover following corporate financial restatements. [10.5465/AMJ.2006.23478165] *Academy of Management Journal, 49*(6), 1119-1136.

Ashbaugh‐Skaife, H., Collins, D. W., & LaFond, R. (2009). The effect of SOX internal control deficiencies on firm risk and cost of equity. *Journal of Accounting Research, 47*(1), 1-43.

Ashbaugh-Skaife, H., Collins, D. W., Kinney Jr, W. R., & LaFond, R. (2008). The effect of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review, 83*(1), 217-250.

Atkinson, A. A., Banker, R., Kaplan, R. S., & Young, S. M. (2001). *Management accounting* (3rd ed.). Upper Saddle River, New Jersey: Prentice-Hall.

Banker, R. D., Potter, G., & Srinivasan, D. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *The Accounting Review, 75*(1), 65-92. doi:10.2308/accr.2000.75.1.65

Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal of Financial Economics, 80*(3), 511-529.

Bonner, S. E., Hastie, R., Sprinkle, G. B., & Young, S. M. (2000). A review of the effects of financial incentives on performance in laboratory tasks: Implications for management accounting. *Journal of Management Accounting Research, 12*(1), 19-64.

Bonner, S. E., & Sprinkle, G. B. (2002). The effects of monetary incentives on effort and task performance: Theories, evidence, and a framework for research. *Accounting, Organizations and Society, 27*(4–5), 303-345.

Burks, J. J. (2010). Disciplinary measures in response to restatements after Sarbanes–Oxley. *Journal of Accounting and Public Policy, 29*(3), 195-225.

Burns, N., & Kedia, S. (2006). The impact of performance-based compensation on misreporting. *Journal of Financial Economics, 79*(1), 35-67.

Busco, C. (2005). Beyond compliance: Why integrated governance matters today. *Strategic Finance,* (8), 35-43.

Bushman, R. M., Indjejikian, R. J., & Smith, A. (1996). CEO compensation: The role of individual performance evaluation. *Journal of Accounting and Economics, 21*(2), 161-193.

Carter, M. E., Lynch, L. J., & Zechman, S. L. (2009). Changes in bonus contracts in the post-Sarbanes–Oxley era. *Review of Accounting Studies, 14*(4), 480-506.

Cheng, Q., & Farber, D. B. (2008). Earnings restatements, changes in CEO compensation, and firm performance. *The Accounting Review, 83*(5), 1217-1250.

Cheng, Q., & Warfield, T. D. (2005). Equity incentives and earnings management. *The Accounting Review, 80*(2), 441-476.

Core, J. E., Guay, W. R., & Larcker, D. F. (2003). Executive equity compensation and incentives: A survey. *Economic Policy Review, 9*(1)

Core, J. E., Holthausen, R. W., & Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance1. *Journal of Financial Economics, 51*(3), 371-406.

Cornett, M. M., Marcus, A. J., & Tehranian, H. (2008). Corporate governance and pay-for-performance: The impact of earnings management. *Journal of Financial Economics, 87*(2), 357-373.

Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics, 18*(1), 3-42.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior* Springer Science & Business Media.

Doyle, J. T., Ge, W., & McVay, S. (2007). Accruals quality and internal control over financial reporting. *The Accounting Review, 82*(5), 1141-1170.

Efendi, J., Srivastava, A., & Swanson, E. P. (2007). Why do corporate managers misstate financial statements? the role of option compensation and other factors. *Journal of Financial Economics, 85*(3), 667-708.

Elder, R., Zhang, Y., Zhou, J., & Zhou, N. (2009). Internal control weaknesses and client risk management. *Journal of Accounting, Auditing & Finance, 24*(4), 543-579.

Erickson, M., Hanlon, M., & Maydew, E. L. (2006). Is there a link between executive equity incentives and accounting fraud? *Journal of Accounting Research, 44*(1), 113-143. doi:10.1111/j.1475-679X.2006.00194.x

Feng, M., Ge, W., Luo, S., & Shevlin, T. (2011). Why do CFOs become involved in material accounting manipulations? *Journal of Accounting and Economics, 51*(1), 21-36.

Frank, M. Z., & Goyal, V. K. (2007). Corporate leverage: How much do managers really matter? *Available at SSRN 971082,*

Frank, R. H. (1991). *Microeconomics and behavior* (7th ed.). New York: McGraw-Hill.

Frey, B. S., & Jegen, R. (2001). Motivation crowding theory. *Journal of Economic Surveys, 15*(5), 589-611. doi:10.1111/1467-6419.00150

Geiger, M. A., & North, D. S. (2006). Does hiring a new CFO change things? an investigation of changes in discretionary accruals. *The Accounting Review, 81*(4), 781-809. doi:10.2308/accr.2006.81.4.781

Gore, A. K., Matsunaga, S., & Yeung, E. P. (2011). The role of technical expertise in firm governance structure: Evidence from chief financial officer contractual incentives. *Strategic Management Journal, 32*(7), 771-786. doi:10.1002/smj.907

Grinstein, Y., & Hribar, P. (2004). CEO compensation and incentives: Evidence from M&A bonuses. *Journal of Financial Economics, 73*(1), 119-143.

Grossman, S. J., & Hart, O. D. (1986). The costs and benefits of ownership: A theory of vertical and lateral integration. *The Journal of Political Economy,* , 691-719.

Hammersley, J. S., Myers, L. A., & Zhou, J. (2012). The failure to remediate previously disclosed material weaknesses in internal controls. *Auditing, 31*(2), 73-111.

Harris, M., & Raviv, A. (1979). Optimal incentive contracts with imperfect information. *Journal of Economic Theory, 20*(2), 231-259.

Hoitash, R., Hoitash, U., & Bedard, J. C. (2008). Internal control quality and audit pricing under the sarbanes-oxley act. *Auditing, 27*(1), 105-126.

Hoitash, R., Hoitash, U., & Johnstone, K. M. (2012). Internal control material weaknesses and CFO compensation\*. *Contemporary Accounting Research, 29*(3), 768-803. doi:10.1111/j.1911-3846.2011.01122.x

Hölmstrom, B. (1979). Moral hazard and observability. *The Bell Journal of Economics,* , 74-91.

Horngren, C. T., Foster, G., & Datar, S. M. (2000). *Cost accounting: A managerial emphasis* (10th ed.). Upper Saddle River, New Jersey: Prentice-Hall.

Indjejikian, R., & Matêjka, M. (2009). CFO fiduciary responsibilities and annual bonus incentives. *Journal of Accounting Research, 47*(4), 1061-1093. doi:10.1111/j.1475-679X.2009.00343.x

Ittner, C. D., Larcker, D. F., & Rajan, M. V. (1997). The choice of performance measures in annual bonus contracts. *The Accounting Review, 72*(2), 231-255.

Jenkins Jr, G. D. (1986). Financial incentives. *Generalizing from Laboratory to Field Settings,* , 167-180.

Jenkins Jr, G. D., Mitra, A., Gupta, N., & Shaw, J. D. (1998). Are financial incentives related to performance? A meta-analytic review of empirical research. *Journal of Applied Psychology, 83*(5), 777.

Jensen, M. C., & Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of Political Economy,* , 225-264.

Jensen, M. C., & Meckling, W. H. (1976). [Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure] *Journal of Financial Economics, 3*(4), 305-360.

Jiang, J. X., Petroni, K. R., & Wang, I. Y. (2010). CFOs and CEOs: Who have the most influence on earnings management? *Journal of Financial Economics, 96*(3), 513-526.

Kerr, S., & Landauer, S. (2004). Using stretch goals to promote organizational effectiveness and personal growth: General electric and goldman sachs. *The Academy of Management Executive, 18*(4), 122-123.

Kohn, A. (1993). *Why Incentive Plans Cannot Work,*

Lambert, R., Leuz, C., & Verrecchia, R. E. (2007). Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research, 45*(2), 385-420.

Larcker, D. F., Richardson, S. A., & Tuna, I. (2007). Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review, 82*(4), 963-1008.

Li, C., Sun, L., & Ettredge, M. (2010). Financial executive qualifications, financial executive turnover, and adverse SOX 404 opinions. *Journal of Accounting and Economics, 50*(1), 93-110.

Libby, R. (1981). *Accounting and human information processing: Theory and applications* Prentice Hall.

Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics, 38*(2), 163-184.

Merchant, K. A. (1982). The control function of management. *Sloan Management Review, 23*(4), 43-55.

Merchant, K. A., & Van der Stede, W. A. (2007). *Management control systems: Performance measurement, evaluation and incentives* Pearson Education.

Mergenthaler, R. D., Rajgopal, S., & Srinivasan, S. (2012). *CEO and CFO career penalties to missing quarterly analysts forecasts.* Unpublished manuscript.

Mian, S. (2001). On the choice and replacement of chief financial officers. *Journal of Financial Economics, 60*(1), 143-175.

Palepu, K. G., Healy, P. M., & Peek, E. (2007). *Business analysis and valuation: Text and cases* Thomson.

Paul, J. M. (1992). On the efficiency of stock-based compensation. *Review of Financial Studies, 5*(3), 471-502.

Rajgopal, S., & Shevlin, T. (2002). Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting and Economics, 33*(2), 145-171.

Ramos, M. (2004, Oct 1). Section 404 compliance in the annual report. *Journal of Accountancy*

Rappaport, A. (2005). The economics of short-term performance obsession. *Financial Analysts Journal, 61*(3), 65-79.

Schiehll, E., & Bellavance, F. (2009). Boards of directors, CEO ownership, and the use of non-financial performance measures in the CEO bonus plan. *Corporate Governance: An International Review, 17*(1), 90-106. doi:10.1111/j.1467-8683.2008.00723.x

Sloan, R. G. (1993). Accounting earnings and top executive compensation. *Journal of Accounting and Economics, 16*(1), 55-100.

Smith, M. (2014). *Research methods in accounting* Sage.

Trochim, W. M. K. (2006). Research methods knowledge base. Retrieved from http://www.socialresearchmethods.net/kb/constval.php

US House of Representatives. (2002). The sarbanes-oxley act of 2002. public law 107-204 [HR 3763].

US Legal. (2015). Breach of fiduciary duty law & legal definition. Retrieved from http://definitions.uslegal.com/b/breach-of-fiduciary-duty

Wunsche, A. (2007). The CFO as strategist and catalyst in building a high-performance culture. *Ivey Business Journal,*

Zimmerman, J. L. (2000). *Accounting for decision making and control* (3rd ed.). Boston: Irwin/McGraw-Hill.

# 8 Appendix

## 8.1 Overview of previous research

### 8.1.1 Literature with the focus on corporate governance and control systems

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Literature with the focus on corporate governance and control systems | | | | | |
| Authors | Context | Findings | Sample | Methods | Contribution |
| Jensen & Meckling (1976) | Agency theory | Despite its shortcomings such as agency costs, the model of publicly held business survived. | - | Literature review | Developing a theory of ownership structure of the firm. |
| Merchant (1982) | Management control | Understanding of controls is important for management decisions. | - | Literature review | Provides a new look at the basic management problem. |
| Merchant & van der Stede (2007) | Management control | - | - | Literature review | Provides a comprehensive overview of the field of management control. |

### 8.1.2 Literature on the relation between monetary compensation and performance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Literature on relation between monetary compensation and performance | | | | | |
| Authors | Context | Findings | Sample | Methods | Contribution |
| Jenkins (1986) | Monetary incentive compensation and performance | Financial incentives only affect performance quantity, but not performance quality. | 28 studies from 1960 -1985 | Meta-analysis | Better understanding of the effects of financial incentives. |
| Kohn (1993) | Monetary incentive compensation and performance | Financial incentives are an ineffective motivator because of psychological influences. | Several studies from 1975 - 1992 | Review | Better understanding of the effects of financial incentives. |
| Jenkins et al. (1998) | Monetary incentive compensation and performance | Financial incentives only affect performance quantity, but not performance quality. | 39 studies from 1975 - 1996 | Meta-analysis | Better understanding of the effects of financial incentives. |
| Bonner et al. (2000) | Monetary incentive compensation and performance | Task type and incentive type affect the efficacy of financial incentives. | - | Review | Understanding the conditions under which financial incentives improve performance. |
| Horngren et al. (2000) | Monetary incentive compensation and performance | Positive relation between monetary compensation and effort. | - | Review | Provides a comprehensive overview of management accounting literature. |
| Zimmerman (2000) | Monetary incentive compensation and performance | Positive relation between monetary compensation and effort. | - | Review | Provides a comprehensive overview of management accounting literature. |
| Atkinson et al. (2001) | Monetary incentive compensation and performance | Positive relation between monetary compensation and effort. | - | Review | Provides a comprehensive overview of management accounting literature. |
| Frank (1991) | Micro-economic view on decision-making behaviour. | - | - | - | Provides a comprehensive overview of the field of micro-economic behaviour. |
| Frey & Jegen (2001) | Motivation crowding theory | Empirical evidence for crowding-out effect after providing monetary incentives. | - | Review | Empirical evidence regarding the crowding-out theory. |
| Bonner & Sprinkle (2002) | Monetary incentives and performance | Provides an overview and directions for future research. | - | Review | Makes clear that there is important research to examine |

### 8.1.3 Literature on the relation between equity-based compensation and performance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Literature on the relation between equity-based compensation and performance | | | | | |
| Authors | Context | Findings | Sample | Methods | Contribution |
| Harris & Raviv (1979) | Relationship between the optimal incentive contract and the available information | There are potential gains to supervision. | - | Mathematical models | Providing a rational explanation for many observed contractual relationships. |
| Hölstrom (1979) | Relationship between the optimal incentive contract and the available information | Tying managers compensation to firm performance motivates value-maximizing decisions. | - | Mathematical models | Explains the extensive use of imperfect information in contracting. |
| Grossman & Hart (1986) | Incentives in an principal-agent problem | Tying managers compensation to firm performance motivates value-maximizing decisions. | - | Mathematical models | Provides insights in the form of an optimal incentive scheme and indicates factors the determine how serious a particular incentive problem is. |
| Jensen & Murphy (1990) | Equity-based compensation for top directors | The private wealth of top directors increases with $3,25 for every $1000 increase of firm value, which is relatively insensitive. | 2213 CEOs listed in the Executive Compensation Surveys from 1974 to 1986 | OLS regression  Y=Change in CEO salary and bonus  X=Change in shareholder wealth | Estimation of the magnitude of the incentives provided by equity-based compensation. |
| Paul (1992) | Efficiency of stock-based compensation | Stock price is not an optimal aggregator of information and therefore not and optimal indicator of performance. | - | Mathematical models | Provides insights in the optimal information indicators for executive compensation. |
| Sloan (1993) | Equity-based compensation for top directors | Earnings are more sensitive to firm-specific changes in value than to market-wide changes and therefore a better base of compensation than equity. | 6132 firms | OLS regression  Y=Sensitivity of compensation to earnings performance  X=Noise in earnings | Implications for the policy description that earnings-based incentives should replace equity-based incentives. |
| Mehran (1995) | Equity-based compensation for top directors | Firm performance is positively related to the percentage of equity held by managers and their compensation that is equity-based. | Top directors of 153 randomly selected manufacturing firms from 1979-1980 | Cross-sectional OLS regression | Underscoring the importance of compensation in the form of equity. |
| Cheng & Warfield (2005) | Equity incentives and earnings management | Positive relation between equity-based compensation and earnings management | CEOs compensation in 9472 firm-years from 1993 to 2000. | OLS regression | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Burns & Kedia (2006) | Equity incentives and misreporting | Positive relation between the CEOs option portfolio and misreporting. | 215 restating firms from 1995 to 2001 | Logistic regression  Y=Misreporting  X=CEO equity incentives | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Bergstresser & Philippon (2006) | Equity incentives and misreporting | Positive relation between equity-based compensation and discretionary accruals. | Over 4000 observations | OLS Regression  Y=Accruals  X=CEO equity incentives | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Efendi et al. (2007) | Equity incentives and misstatements | Positive relation between equity-based compensation and misstatements. | 190 companies that restated from 1997 to 2002. | Multivariate regression  Y=Likelihood of restatement  X=Equity compensation | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Larcker et al. (2007) | Association between corporate governance factors and accounting outcomes | Little relation between 14 dimensions of corporate governance and restatements. | 2106 firms from 2002 to 2003 | Logistic regression  Y=Restatement  X=Governance factors | Provides insights in the optimal construction of governance structures regarding accounting performance. |
| Cheng & Farber (2008) | Equity incentives and misreporting | Proportion of CEOs equity compensation declines in the two years after the restatement. | 289 restatement firms from 1997 to 2001 | OLS regression  Y=Change in CEO equity compensation  X=Restatement | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Cornett et al. (2008) | Equity incentives and misreporting | Positive relation between equity-based compensation and earnings management. | Firms included in the S&P 100 Index from 1994 to 2003 | OLS regression  Y=Discretionary accruals  X=Equity compensation | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Armstrong et al. (2010) | Equity incentives and accounting irregularities | No relation between CEO equity-based compensation and accounting irregularities. | 20000 observations from 2001 to 2005. | Logistic regression  Y=Accounting irregularities  X=Equity compensation | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Jiang et al. (2010) | Equity incentives and earnings management | More association between accruals management or forecast beating and CFO equity incentives than accruals management or forecast beating and CEO equity incentives. | 17542 firm-years from 1993 to 2006 | OLS regression  Y=Earnings management and analyst forecast beating  X=Equity compensation | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Feng et al. (2011) | Equity incentives and earnings management | No relation for CFOs between equity incentives and accounting manipulations. Positive relation for CEOs between equity incentives and accounting manipulations. | 130 firm-years from 1982 to 2005 | Logistic regression  Y=Accounting manipulations  X=Equity compensation | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |
| Armstrong et al. (2013) | Equity incentives and misreporting | Positive relation between equity-based executive compensation and misreporting. | 20445 firm-years from 1992-2009 | OLS Regression  Y=Restatement  X=Executive equity incentives | Provides insights in the optimal construction of executive compensation contracts regarding the consequences of equity-based compensation. |

### 8.1.4 Literature on the CFO performance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Literature on the CFO fiduciary responsibility | | | | | | |
| Authors | Context | Findings | Sample | Methods | Proxy fiduciary performance | Contribution |
| Arthaud-Day et al. (2006) | Association between executive turnover and financial restatements | Executives that file a restatement are twice as likely to exit the firm. | 232 firm filing a restatement from 1998 to 1999 | Cox regression  Y=Executive exit  X=Restatement | Restatement | Insight in the consequences of a restatement and the causes of executive exit. |
| Geiger & North (2006) | The influence of appointment of a new CFO | Discretionary accruals decreased following the appointment of a new CFO. | 712 companies that appointed a new CFO in the period 1994 to 2000 | Multivariate regression  Y=Discretionary accruals  X=CFO appointment | Discretionary accruals | Empirical evidence of the consequences of CFO rotation. |
| Indjejikian & Matêjka (2009) | CFO fiduciary responsibilities and bonus compensation | Less emphasis of bonus compensation on financial performance in the years 2003 to 2006. | Survey on 1353 respondents from both public and private entities | OLS regression  Y=Bonus weight on financial performance  X=Years after SOx | Firm financial performance as a counterpart of fiduciary performance | Empirical evidence of the consequences of SOx regarding CFO fiduciary incentive compensation. |
| Li et al. (2010) | Association between CFO performance and CFO qualifications | Firms that encounter ICMW have less qualified CFOs. | 2478 companies in the fiscal year 2004 | Logistic regression  Y=ICMW disclosure  X=CFO qualifications | Internal Control Material Weakness Disclosure | Understanding consequences of CFO qualifications and the causes of ICMW disclosure. |
| Burks (2010) | Disciplinary measures in response to restatements | Bonus decrease for CEOs and termination for CFOs after restatements. | 2309 restatements by publicly traded companies from 1997 to 2005 | Logistic regression  Y=Turnover  X=Restatement  Multivariate regression  Y=Bonus compensation  X=Restatement | Restatement | Insight in the consequences of a restatement and the causes of executive exit and compensation changes. |
| Johnstone et al. (2011) | Changes in corporate governance associated with ICMW disclosure and their remediation | Disclosure of ICMW is positively associated with subsequent turnover of executives. | 733 firms that reported ICMW and 3602 that that did not report ICMW from 2004 to 2008. | Logistic regression  Y=Executive turnover  X=ICMW | Internal Control Material Weakness | Empirical evidence regarding the consequences of ICMW disclosure. |
| Hoitash et al. (2012) | Fiduciary performance and CFO compensation | Negative association between ICMW disclosures and the change in CFO bonus compensation. | 604 firms in the fiscal year 2005 | OLS regression  Y=CFO compensation  X=ICMW disclosure | Internal Control Material Weakness Disclosure | Empirical evidence regarding the relation between CFO compensation and fiduciary performance. |

## 8.2 Additional mutual relations of deciles

##### Table 12: Mutual relations hypothesis 2a

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (I) Decile | (J) Decile | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| 1,0 | 2,0 | -,812287966098205\* | ,411769033225152 | ,049 | -1,619458020626016 | -,005117911570395 |
| 3,0 | -,995769580867592\* | ,374572887784078 | ,008 | -1,730025908715331 | -,261513253019854 |
| 4,0 | -1,599962997492201\* | ,355363861271693 | ,000 | -2,296564840115575 | -,903361154868828 |
| 5,0 | -1,560405683260520\* | ,335622317782498 | ,000 | -2,218309174505139 | -,902502192015900 |
| 6,0 | -2,464407739809581\* | ,327383957604918 | ,000 | -3,106161989374531 | -1,822653490244632 |
| 7,0 | -2,262015575282851\* | ,313617418886852 | ,000 | -2,876783973773262 | -1,647247176792440 |
| 8,0 | -2,664388962995524\* | ,304730094269515 | ,000 | -3,261735987567173 | -2,067041938423875 |
| 9,0 | -3,279476575021915\* | ,313515729117165 | ,000 | -3,894045636188923 | -2,664907513854907 |
| 10,0 | -2,245001778805238\* | ,251378279088749 | ,000 | -2,737765932656083 | -1,752237624954394 |
| 2,0 | 1,0 | ,812287966098205\* | ,411769033225152 | ,049 | ,005117911570395 | 1,619458020626016 |
| 3,0 | -,183481614769387 | ,458903036505497 | ,689 | -1,083046077152309 | ,716082847613536 |
| 4,0 | -,787675031393996 | ,443362856528362 | ,076 | -1,656776863254975 | ,081426800466983 |
| 5,0 | -,748117717162314 | ,427702570537936 | ,080 | -1,586521480745046 | ,090286046420418 |
| 6,0 | -1,652119773711376\* | ,421268802960913 | ,000 | -2,477911747414500 | -,826327800008252 |
| 7,0 | -1,449727609184645\* | ,410661702719298 | ,000 | -2,254727019606973 | -,644728198762318 |
| 8,0 | -1,852100996897319\* | ,403915311673832 | ,000 | -2,643875797432441 | -1,060326196362197 |
| 9,0 | -2,467188608923710\* | ,410584048709798 | ,000 | -3,272035798110283 | -1,662341419737136 |
| 10,0 | -1,432713812707033\* | ,365346668041030 | ,000 | -2,148884447624557 | -,716543177789509 |
| 3,0 | 1,0 | ,995769580867592\* | ,374572887784078 | ,008 | ,261513253019854 | 1,730025908715331 |
| 2,0 | ,183481614769387 | ,458903036505497 | ,689 | -,716082847613536 | 1,083046077152309 |
| 4,0 | -,604193416624609 | ,409049794143349 | ,140 | -1,406033084015869 | ,197646250766651 |
| 5,0 | -,564636102392927 | ,392021173387975 | ,150 | -1,333095423923811 | ,203823219137957 |
| 6,0 | -1,468638158941989\* | ,384991578983031 | ,000 | -2,223317721332887 | -,713958596551090 |
| 7,0 | -1,266245994415258\* | ,373355253907107 | ,001 | -1,998115456025942 | -,534376532804574 |
| 8,0 | -1,668619382127932\* | ,365921700018318 | ,000 | -2,385917223209619 | -,951321541046244 |
| 9,0 | -2,283706994154323\* | ,373269838849399 | ,000 | -3,015409020938139 | -1,552004967370506 |
| 10,0 | -1,249232197937646\* | ,322845627798193 | ,000 | -1,882090188624487 | -,616374207250805 |
| 4,0 | 1,0 | 1,599962997492201\* | ,355363861271693 | ,000 | ,903361154868828 | 2,296564840115575 |
| 2,0 | ,787675031393996 | ,443362856528362 | ,076 | -,081426800466983 | 1,656776863254975 |
| 3,0 | ,604193416624609 | ,409049794143349 | ,140 | -,197646250766651 | 1,406033084015869 |
| 5,0 | ,039557314231682 | ,373710082844321 | ,916 | -,693007700636991 | ,772122329100355 |
| 6,0 | -,864444742317380\* | ,366329280187745 | ,018 | -1,582541542235296 | -,146347942399464 |
| 7,0 | -,662052577790649 | ,354080176309073 | ,062 | -1,356138077567258 | ,032032921985960 |
| 8,0 | -1,064425965503323\* | ,346233037388577 | ,002 | -1,743129114886234 | -,385722816120411 |
| 9,0 | -1,679513577529714\* | ,353990110355756 | ,000 | -2,373422525563516 | -,985604629495912 |
| 10,0 | -,645038781313037\* | ,300346341784669 | ,032 | -1,233792557129396 | -,056285005496678 |
| 5,0 | 1,0 | 1,560405683260520\* | ,335622317782498 | ,000 | ,902502192015900 | 2,218309174505139 |
| 2,0 | ,748117717162314 | ,427702570537936 | ,080 | -,090286046420418 | 1,586521480745046 |
| 3,0 | ,564636102392927 | ,392021173387975 | ,150 | -,203823219137957 | 1,333095423923811 |
| 4,0 | -,039557314231682 | ,373710082844321 | ,916 | -,772122329100355 | ,693007700636991 |
| 6,0 | -,904002056549062\* | ,347211762212400 | ,009 | -1,584623750809487 | -,223380362288637 |
| 7,0 | -,701609892022331\* | ,334262827055048 | ,036 | -1,356848442205183 | -,046371341839480 |
| 8,0 | -1,103983279735004\* | ,325938924455317 | ,001 | -1,742904903745229 | -,465061655724780 |
| 9,0 | -1,719070891761396\* | ,334167419904229 | ,000 | -2,374122420121537 | -1,064019363401254 |
| 10,0 | -,684596095544719\* | ,276707049637703 | ,013 | -1,227010960001436 | -,142181231088001 |
| 6,0 | 1,0 | 2,464407739809581\* | ,327383957604918 | ,000 | 1,822653490244632 | 3,106161989374531 |
| 2,0 | 1,652119773711376\* | ,421268802960913 | ,000 | ,826327800008252 | 2,477911747414500 |
| 3,0 | 1,468638158941989\* | ,384991578983031 | ,000 | ,713958596551090 | 2,223317721332887 |
| 4,0 | ,864444742317380\* | ,366329280187745 | ,018 | ,146347942399464 | 1,582541542235296 |
| 5,0 | ,904002056549062\* | ,347211762212400 | ,009 | ,223380362288637 | 1,584623750809487 |
| 7,0 | ,202392164526731 | ,325990111896351 | ,535 | -,436629799640807 | ,841414128694268 |
| 8,0 | -,199981223185943 | ,317449362857214 | ,529 | -,822261188049568 | ,422298741677682 |
| 9,0 | -,815068835212334\* | ,325892282861702 | ,012 | -1,453899030060519 | -,176238640364149 |
| 10,0 | ,219405961004343 | ,266654658355268 | ,411 | -,303303708149014 | ,742115630157699 |
| 7,0 | 1,0 | 2,262015575282851\* | ,313617418886852 | ,000 | 1,647247176792440 | 2,876783973773262 |
| 2,0 | 1,449727609184645\* | ,410661702719298 | ,000 | ,644728198762318 | 2,254727019606973 |
| 3,0 | 1,266245994415258\* | ,373355253907107 | ,001 | ,534376532804574 | 1,998115456025942 |
| 4,0 | ,662052577790649 | ,354080176309073 | ,062 | -,032032921985960 | 1,356138077567258 |
| 5,0 | ,701609892022331\* | ,334262827055048 | ,036 | ,046371341839480 | 1,356848442205183 |
| 6,0 | -,202392164526731 | ,325990111896351 | ,535 | -,841414128694268 | ,436629799640807 |
| 8,0 | -,402373387712673 | ,303232135023061 | ,185 | -,996784038373030 | ,192037262947683 |
| 9,0 | -1,017460999739065\* | ,312059945781262 | ,001 | -1,629176362303684 | -,405745637174445 |
| 10,0 | ,017013796477612 | ,249560286413438 | ,946 | -,472186638082911 | ,506214231038136 |
| 8,0 | 1,0 | 2,664388962995524\* | ,304730094269515 | ,000 | 2,067041938423875 | 3,261735987567173 |
| 2,0 | 1,852100996897319\* | ,403915311673832 | ,000 | 1,060326196362197 | 2,643875797432441 |
| 3,0 | 1,668619382127932\* | ,365921700018318 | ,000 | ,951321541046244 | 2,385917223209619 |
| 4,0 | 1,064425965503323\* | ,346233037388577 | ,002 | ,385722816120411 | 1,743129114886234 |
| 5,0 | 1,103983279735004\* | ,325938924455317 | ,001 | ,465061655724780 | 1,742904903745229 |
| 6,0 | ,199981223185943 | ,317449362857214 | ,529 | -,422298741677682 | ,822261188049568 |
| 7,0 | ,402373387712673 | ,303232135023061 | ,185 | -,192037262947683 | ,996784038373030 |
| 9,0 | -,615087612026391\* | ,303126961330166 | ,042 | -1,209292096004509 | -,020883128048274 |
| 10,0 | ,419387184190286 | ,238295785692935 | ,078 | -,047732018108594 | ,886506386489166 |
| 9,0 | 1,0 | 3,279476575021915\* | ,313515729117165 | ,000 | 2,664907513854907 | 3,894045636188923 |
| 2,0 | 2,467188608923710\* | ,410584048709798 | ,000 | 1,662341419737136 | 3,272035798110283 |
| 3,0 | 2,283706994154323\* | ,373269838849399 | ,000 | 1,552004967370506 | 3,015409020938139 |
| 4,0 | 1,679513577529714\* | ,353990110355756 | ,000 | ,985604629495912 | 2,373422525563516 |
| 5,0 | 1,719070891761396\* | ,334167419904229 | ,000 | 1,064019363401254 | 2,374122420121537 |
| 6,0 | ,815068835212334\* | ,325892282861702 | ,012 | ,176238640364149 | 1,453899030060519 |
| 7,0 | 1,017460999739065\* | ,312059945781262 | ,001 | ,405745637174445 | 1,629176362303684 |
| 8,0 | ,615087612026391\* | ,303126961330166 | ,042 | ,020883128048274 | 1,209292096004509 |
| 10,0 | 1,034474796216677\* | ,249432482907446 | ,000 | ,545524888418917 | 1,523424704014436 |
| 10,0 | 1,0 | 2,245001778805238\* | ,251378279088749 | ,000 | 1,752237624954394 | 2,737765932656083 |
| 2,0 | 1,432713812707033\* | ,365346668041030 | ,000 | ,716543177789509 | 2,148884447624557 |
| 3,0 | 1,249232197937646\* | ,322845627798193 | ,000 | ,616374207250805 | 1,882090188624487 |
| 4,0 | ,645038781313037\* | ,300346341784669 | ,032 | ,056285005496678 | 1,233792557129396 |
| 5,0 | ,684596095544719\* | ,276707049637703 | ,013 | ,142181231088001 | 1,227010960001436 |
| 6,0 | -,219405961004343 | ,266654658355268 | ,411 | -,742115630157699 | ,303303708149014 |
| 7,0 | -,017013796477612 | ,249560286413438 | ,946 | -,506214231038136 | ,472186638082911 |
| 8,0 | -,419387184190286 | ,238295785692935 | ,078 | -,886506386489166 | ,047732018108594 |
| 9,0 | -1,034474796216677\* | ,249432482907446 | ,000 | -1,523424704014436 | -,545524888418917 |

##### Table 13: Mutual relations hypothesis 2b1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (I) Decile | (J) Decile | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| 1,0 | 2,0 | ,0004 | ,0193 | ,982 | -,037 | ,038 |
| 3,0 | ,0094 | ,0171 | ,584 | -,024 | ,043 |
| 4,0 | ,0136 | ,0161 | ,400 | -,018 | ,045 |
| 5,0 | ,0024 | ,0154 | ,874 | -,028 | ,033 |
| 6,0 | ,0060 | ,0148 | ,684 | -,023 | ,035 |
| 7,0 | -,0230 | ,0143 | ,109 | -,051 | ,005 |
| 8,0 | -,0061 | ,0139 | ,661 | -,033 | ,021 |
| 9,0 | -,0101 | ,0144 | ,481 | -,038 | ,018 |
| 10,0 | -,0206 | ,0113 | ,069 | -,043 | ,002 |
| 2,0 | 1,0 | -,0004 | ,0193 | ,982 | -,038 | ,037 |
| 3,0 | ,0089 | ,0216 | ,679 | -,033 | ,051 |
| 4,0 | ,0131 | ,0208 | ,529 | -,028 | ,054 |
| 5,0 | ,0020 | ,0203 | ,921 | -,038 | ,042 |
| 6,0 | ,0056 | ,0199 | ,778 | -,033 | ,045 |
| 7,0 | -,0234 | ,0195 | ,230 | -,062 | ,015 |
| 8,0 | -,0065 | ,0192 | ,734 | -,044 | ,031 |
| 9,0 | -,0106 | ,0195 | ,589 | -,049 | ,028 |
| 10,0 | -,0210 | ,0174 | ,228 | -,055 | ,013 |
| 3,0 | 1,0 | -,0094 | ,0171 | ,584 | -,043 | ,024 |
| 2,0 | -,0089 | ,0216 | ,679 | -,051 | ,033 |
| 4,0 | ,0042 | ,0189 | ,825 | -,033 | ,041 |
| 5,0 | -,0069 | ,0183 | ,704 | -,043 | ,029 |
| 6,0 | -,0033 | ,0178 | ,851 | -,038 | ,032 |
| 7,0 | -,0323 | ,0174 | ,063 | -,066 | ,002 |
| 8,0 | -,0155 | ,0170 | ,364 | -,049 | ,018 |
| 9,0 | -,0195 | ,0174 | ,263 | -,054 | ,015 |
| 10,0 | -,0299\* | ,0150 | ,046 | -,059 | -,001 |
| 4,0 | 1,0 | -,0136 | ,0161 | ,400 | -,045 | ,018 |
| 2,0 | -,0131 | ,0208 | ,529 | -,054 | ,028 |
| 3,0 | -,0042 | ,0189 | ,825 | -,041 | ,033 |
| 5,0 | -,0111 | ,0173 | ,521 | -,045 | ,023 |
| 6,0 | -,0075 | ,0168 | ,655 | -,040 | ,025 |
| 7,0 | -,0365\* | ,0164 | ,026 | -,069 | -,004 |
| 8,0 | -,0196 | ,0160 | ,220 | -,051 | ,012 |
| 9,0 | -,0237 | ,0164 | ,149 | -,056 | ,009 |
| 10,0 | -,0341\* | ,0138 | ,014 | -,061 | -,007 |
| 5,0 | 1,0 | -,0024 | ,0154 | ,874 | -,033 | ,028 |
| 2,0 | -,0020 | ,0203 | ,921 | -,042 | ,038 |
| 3,0 | ,0069 | ,0183 | ,704 | -,029 | ,043 |
| 4,0 | ,0111 | ,0173 | ,521 | -,023 | ,045 |
| 6,0 | ,0036 | ,0161 | ,824 | -,028 | ,035 |
| 7,0 | -,0254 | ,0157 | ,105 | -,056 | ,005 |
| 8,0 | -,0085 | ,0153 | ,577 | -,039 | ,021 |
| 9,0 | -,0126 | ,0157 | ,424 | -,043 | ,018 |
| 10,0 | -,0230 | ,0130 | ,076 | -,048 | ,002 |
| 6,0 | 1,0 | -,0060 | ,0148 | ,684 | -,035 | ,023 |
| 2,0 | -,0056 | ,0199 | ,778 | -,045 | ,033 |
| 3,0 | ,0033 | ,0178 | ,851 | -,032 | ,038 |
| 4,0 | ,0075 | ,0168 | ,655 | -,025 | ,040 |
| 5,0 | -,0036 | ,0161 | ,824 | -,035 | ,028 |
| 7,0 | -,0290 | ,0151 | ,055 | -,059 | ,001 |
| 8,0 | -,0121 | ,0147 | ,410 | -,041 | ,017 |
| 9,0 | -,0162 | ,0152 | ,287 | -,046 | ,014 |
| 10,0 | -,0266\* | ,0123 | ,031 | -,051 | -,002 |
| 7,0 | 1,0 | ,0230 | ,0143 | ,109 | -,005 | ,051 |
| 2,0 | ,0234 | ,0195 | ,230 | -,015 | ,062 |
| 3,0 | ,0323 | ,0174 | ,063 | -,002 | ,066 |
| 4,0 | ,0365\* | ,0164 | ,026 | ,004 | ,069 |
| 5,0 | ,0254 | ,0157 | ,105 | -,005 | ,056 |
| 6,0 | ,0290 | ,0151 | ,055 | -,001 | ,059 |
| 8,0 | ,0169 | ,0142 | ,235 | -,011 | ,045 |
| 9,0 | ,0128 | ,0147 | ,382 | -,016 | ,042 |
| 10,0 | ,0024 | ,0117 | ,839 | -,021 | ,025 |
| 8,0 | 1,0 | ,0061 | ,0139 | ,661 | -,021 | ,033 |
| 2,0 | ,0065 | ,0192 | ,734 | -,031 | ,044 |
| 3,0 | ,0155 | ,0170 | ,364 | -,018 | ,049 |
| 4,0 | ,0196 | ,0160 | ,220 | -,012 | ,051 |
| 5,0 | ,0085 | ,0153 | ,577 | -,021 | ,039 |
| 6,0 | ,0121 | ,0147 | ,410 | -,017 | ,041 |
| 7,0 | -,0169 | ,0142 | ,235 | -,045 | ,011 |
| 9,0 | -,0040 | ,0143 | ,777 | -,032 | ,024 |
| 10,0 | -,0145 | ,0112 | ,195 | -,036 | ,007 |
| 9,0 | 1,0 | ,0101 | ,0144 | ,481 | -,018 | ,038 |
| 2,0 | ,0106 | ,0195 | ,589 | -,028 | ,049 |
| 3,0 | ,0195 | ,0174 | ,263 | -,015 | ,054 |
| 4,0 | ,0237 | ,0164 | ,149 | -,009 | ,056 |
| 5,0 | ,0126 | ,0157 | ,424 | -,018 | ,043 |
| 6,0 | ,0162 | ,0152 | ,287 | -,014 | ,046 |
| 7,0 | -,0128 | ,0147 | ,382 | -,042 | ,016 |
| 8,0 | ,0040 | ,0143 | ,777 | -,024 | ,032 |
| 10,0 | -,0104 | ,0118 | ,375 | -,034 | ,013 |
| 10,0 | 1,0 | ,0206 | ,0113 | ,069 | -,002 | ,043 |
| 2,0 | ,0210 | ,0174 | ,228 | -,013 | ,055 |
| 3,0 | ,0299\* | ,0150 | ,046 | ,001 | ,059 |
| 4,0 | ,0341\* | ,0138 | ,014 | ,007 | ,061 |
| 5,0 | ,0230 | ,0130 | ,076 | -,002 | ,048 |
| 6,0 | ,0266\* | ,0123 | ,031 | ,002 | ,051 |
| 7,0 | -,0024 | ,0117 | ,839 | -,025 | ,021 |
| 8,0 | ,0145 | ,0112 | ,195 | -,007 | ,036 |
| 9,0 | ,0104 | ,0118 | ,375 | -,013 | ,034 |

##### Table 14: Mutual relations hypothesis 2b2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (I) Decile | (J) Decile | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| 1,0 | 2,0 | ,002 | ,011 | ,822 | -,02 | ,02 |
| 3,0 | -,005 | ,010 | ,578 | -,02 | ,01 |
| 4,0 | ,016 | ,009 | ,073 | ,00 | ,03 |
| 5,0 | ,008 | ,009 | ,348 | -,01 | ,02 |
| 6,0 | -,001 | ,008 | ,875 | -,02 | ,01 |
| 7,0 | ,001 | ,008 | ,921 | -,01 | ,02 |
| 8,0 | ,012 | ,008 | ,121 | ,00 | ,03 |
| 9,0 | ,009 | ,008 | ,245 | -,01 | ,03 |
| 10,0 | ,013\* | ,006 | ,037 | ,00 | ,03 |
| 2,0 | 1,0 | -,002 | ,011 | ,822 | -,02 | ,02 |
| 3,0 | -,008 | ,012 | ,522 | -,03 | ,02 |
| 4,0 | ,014 | ,012 | ,238 | -,01 | ,04 |
| 5,0 | ,006 | ,011 | ,618 | -,02 | ,03 |
| 6,0 | -,004 | ,011 | ,738 | -,03 | ,02 |
| 7,0 | -,002 | ,011 | ,881 | -,02 | ,02 |
| 8,0 | ,010 | ,011 | ,370 | -,01 | ,03 |
| 9,0 | ,007 | ,011 | ,527 | -,01 | ,03 |
| 10,0 | ,011 | ,010 | ,267 | -,01 | ,03 |
| 3,0 | 1,0 | ,005 | ,010 | ,578 | -,01 | ,02 |
| 2,0 | ,008 | ,012 | ,522 | -,02 | ,03 |
| 4,0 | ,021\* | ,011 | ,042 | ,00 | ,04 |
| 5,0 | ,013 | ,010 | ,189 | -,01 | ,03 |
| 6,0 | ,004 | ,010 | ,685 | -,02 | ,02 |
| 7,0 | ,006 | ,010 | ,528 | -,01 | ,03 |
| 8,0 | ,017 | ,009 | ,068 | ,00 | ,04 |
| 9,0 | ,015 | ,010 | ,132 | ,00 | ,03 |
| 10,0 | ,018\* | ,008 | ,027 | ,00 | ,03 |
| 4,0 | 1,0 | -,016 | ,009 | ,073 | -,03 | ,00 |
| 2,0 | -,014 | ,012 | ,238 | -,04 | ,01 |
| 3,0 | -,021\* | ,011 | ,042 | -,04 | ,00 |
| 5,0 | -,008 | ,010 | ,403 | -,03 | ,01 |
| 6,0 | -,017 | ,009 | ,063 | -,04 | ,00 |
| 7,0 | -,015 | ,009 | ,093 | -,03 | ,00 |
| 8,0 | -,004 | ,009 | ,644 | -,02 | ,01 |
| 9,0 | -,007 | ,009 | ,456 | -,02 | ,01 |
| 10,0 | -,003 | ,008 | ,702 | -,02 | ,01 |
| 5,0 | 1,0 | -,008 | ,009 | ,348 | -,02 | ,01 |
| 2,0 | -,006 | ,011 | ,618 | -,03 | ,02 |
| 3,0 | -,013 | ,010 | ,189 | -,03 | ,01 |
| 4,0 | ,008 | ,010 | ,403 | -,01 | ,03 |
| 6,0 | -,009 | ,009 | ,298 | -,03 | ,01 |
| 7,0 | -,007 | ,009 | ,405 | -,02 | ,01 |
| 8,0 | ,004 | ,009 | ,643 | -,01 | ,02 |
| 9,0 | ,001 | ,009 | ,886 | -,02 | ,02 |
| 10,0 | ,005 | ,007 | ,479 | -,01 | ,02 |
| 6,0 | 1,0 | ,001 | ,008 | ,875 | -,01 | ,02 |
| 2,0 | ,004 | ,011 | ,738 | -,02 | ,03 |
| 3,0 | -,004 | ,010 | ,685 | -,02 | ,02 |
| 4,0 | ,017 | ,009 | ,063 | ,00 | ,04 |
| 5,0 | ,009 | ,009 | ,298 | -,01 | ,03 |
| 7,0 | ,002 | ,008 | ,804 | -,01 | ,02 |
| 8,0 | ,013 | ,008 | ,105 | ,00 | ,03 |
| 9,0 | ,011 | ,008 | ,210 | -,01 | ,03 |
| 10,0 | ,014\* | ,007 | ,035 | ,00 | ,03 |
| 7,0 | 1,0 | -,001 | ,008 | ,921 | -,02 | ,01 |
| 2,0 | ,002 | ,011 | ,881 | -,02 | ,02 |
| 3,0 | -,006 | ,010 | ,528 | -,03 | ,01 |
| 4,0 | ,015 | ,009 | ,093 | ,00 | ,03 |
| 5,0 | ,007 | ,009 | ,405 | -,01 | ,02 |
| 6,0 | -,002 | ,008 | ,804 | -,02 | ,01 |
| 8,0 | ,011 | ,008 | ,157 | ,00 | ,03 |
| 9,0 | ,009 | ,008 | ,298 | -,01 | ,02 |
| 10,0 | ,012 | ,007 | ,057 | ,00 | ,03 |
| 8,0 | 1,0 | -,012 | ,008 | ,121 | -,03 | ,00 |
| 2,0 | -,010 | ,011 | ,370 | -,03 | ,01 |
| 3,0 | -,017 | ,009 | ,068 | -,04 | ,00 |
| 4,0 | ,004 | ,009 | ,644 | -,01 | ,02 |
| 5,0 | -,004 | ,009 | ,643 | -,02 | ,01 |
| 6,0 | -,013 | ,008 | ,105 | -,03 | ,00 |
| 7,0 | -,011 | ,008 | ,157 | -,03 | ,00 |
| 9,0 | -,003 | ,008 | ,734 | -,02 | ,01 |
| 10,0 | ,001 | ,006 | ,851 | -,01 | ,01 |
| 9,0 | 1,0 | -,009 | ,008 | ,245 | -,03 | ,01 |
| 2,0 | -,007 | ,011 | ,527 | -,03 | ,01 |
| 3,0 | -,015 | ,010 | ,132 | -,03 | ,00 |
| 4,0 | ,007 | ,009 | ,456 | -,01 | ,02 |
| 5,0 | -,001 | ,009 | ,886 | -,02 | ,02 |
| 6,0 | -,011 | ,008 | ,210 | -,03 | ,01 |
| 7,0 | -,009 | ,008 | ,298 | -,02 | ,01 |
| 8,0 | ,003 | ,008 | ,734 | -,01 | ,02 |
| 10,0 | ,004 | ,007 | ,555 | -,01 | ,02 |
| 10,0 | 1,0 | -,013\* | ,006 | ,037 | -,03 | ,00 |
| 2,0 | -,011 | ,010 | ,267 | -,03 | ,01 |
| 3,0 | -,018\* | ,008 | ,027 | -,03 | ,00 |
| 4,0 | ,003 | ,008 | ,702 | -,01 | ,02 |
| 5,0 | -,005 | ,007 | ,479 | -,02 | ,01 |
| 6,0 | -,014\* | ,007 | ,035 | -,03 | ,00 |
| 7,0 | -,012 | ,007 | ,057 | -,03 | ,00 |
| 8,0 | -,001 | ,006 | ,851 | -,01 | ,01 |
| 9,0 | -,004 | ,007 | ,555 | -,02 | ,01 |

##### **Table 15: Mutual relations hypothesis** 4

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (I) Decile | (J) Decile | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| 1,0 | 2,0 | ,077061843719339 | ,084996645466228 | ,365 | -,089569346854852 | ,243693034293530 |
| 3,0 | -,010552575881021 | ,080717266139609 | ,896 | -,168794281573759 | ,147689129811718 |
| 4,0 | ,082065588824601 | ,073640703116102 | ,265 | -,062302909104323 | ,226434086753525 |
| 5,0 | ,084870714713198 | ,068894656863273 | ,218 | -,050193423810821 | ,219934853237217 |
| 6,0 | ,001813701649016 | ,067519449363811 | ,979 | -,130554419147893 | ,134181822445925 |
| 7,0 | ,085161955866170 | ,066034505676516 | ,197 | -,044295015517813 | ,214618927250153 |
| 8,0 | ,031831773258399 | ,063711569963112 | ,617 | -,093071212007325 | ,156734758524122 |
| 9,0 | ,099961402019552 | ,064550605521346 | ,122 | -,026586465738132 | ,226509269777235 |
| 10,0 | -,017733848842402 | ,052501599754594 | ,736 | -,120660311718325 | ,085192614033522 |
| 2,0 | 1,0 | -,077061843719339 | ,084996645466228 | ,365 | -,243693034293530 | ,089569346854852 |
| 3,0 | -,087614419600359 | ,097199505494667 | ,367 | -,278168637769292 | ,102939798568574 |
| 4,0 | ,005003745105262 | ,091407986362184 | ,956 | -,174196522293198 | ,184204012503723 |
| 5,0 | ,007808870993859 | ,087629564415576 | ,929 | -,163984010571884 | ,179601752559603 |
| 6,0 | -,075248142070323 | ,086552543912630 | ,385 | -,244929584911699 | ,094433300771053 |
| 7,0 | ,008100112146831 | ,085399196455805 | ,924 | -,159320257227207 | ,175520481520870 |
| 8,0 | -,045230070460940 | ,083615973130257 | ,589 | -,209154529800343 | ,118694388878463 |
| 9,0 | ,022899558300213 | ,084257032279377 | ,786 | -,142281661804986 | ,188080778405412 |
| 10,0 | -,094795692561741 | ,075424696168742 | ,209 | -,242661609532404 | ,053070224408922 |
| 3,0 | 1,0 | ,010552575881021 | ,080717266139609 | ,896 | -,147689129811718 | ,168794281573759 |
| 2,0 | ,087614419600359 | ,097199505494667 | ,367 | -,102939798568574 | ,278168637769292 |
| 4,0 | ,092618164705622 | ,087442937298161 | ,290 | -,078808844788375 | ,264045174199618 |
| 5,0 | ,095423290594219 | ,083485255417974 | ,253 | -,068244903948999 | ,259091485137436 |
| 6,0 | ,012366277530037 | ,082354053757472 | ,881 | -,149084259146390 | ,173816814206463 |
| 7,0 | ,095714531747191 | ,081141050448204 | ,238 | -,063357979484997 | ,254787042979378 |
| 8,0 | ,042384349139419 | ,079262085987316 | ,593 | -,113004556893446 | ,197773255172284 |
| 9,0 | ,110513977900572 | ,079938068534765 | ,167 | -,046200154275876 | ,267228110077020 |
| 10,0 | -,007181272961381 | ,070567216926048 | ,919 | -,145524372355424 | ,131161826432661 |
| 4,0 | 1,0 | -,082065588824601 | ,073640703116102 | ,265 | -,226434086753525 | ,062302909104323 |
| 2,0 | -,005003745105262 | ,091407986362184 | ,956 | -,184204012503723 | ,174196522293198 |
| 3,0 | -,092618164705622 | ,087442937298161 | ,290 | -,264045174199618 | ,078808844788375 |
| 5,0 | ,002805125888597 | ,076664620096794 | ,971 | -,147491592900413 | ,153101844677608 |
| 6,0 | -,080251887175585 | ,075431202248605 | ,287 | -,228130558953541 | ,067626784602371 |
| 7,0 | ,003096367041569 | ,074104967243900 | ,967 | -,142182294858315 | ,148375028941453 |
| 8,0 | -,050233815566202 | ,072042726055044 | ,486 | -,191469568446969 | ,091001937314564 |
| 9,0 | ,017895813194951 | ,072785787784774 | ,806 | -,124796670831096 | ,160588297220997 |
| 10,0 | -,099799437667003 | ,062349083450114 | ,110 | -,222031343991237 | ,022432468657231 |
| 5,0 | 1,0 | -,084870714713198 | ,068894656863273 | ,218 | -,219934853237217 | ,050193423810821 |
| 2,0 | -,007808870993859 | ,087629564415576 | ,929 | -,179601752559603 | ,163984010571884 |
| 3,0 | -,095423290594219 | ,083485255417974 | ,253 | -,259091485137436 | ,068244903948999 |
| 4,0 | -,002805125888597 | ,076664620096794 | ,971 | -,153101844677608 | ,147491592900413 |
| 6,0 | -,083057013064182 | ,070805274249481 | ,241 | -,221866810585086 | ,055752784456722 |
| 7,0 | ,000291241152972 | ,069390682076874 | ,997 | -,135745327182173 | ,136327809488117 |
| 8,0 | -,053038941454799 | ,067183889187189 | ,430 | -,184749215210414 | ,078671332300815 |
| 9,0 | ,015090687306353 | ,067980081585156 | ,824 | -,118180477311149 | ,148361851923856 |
| 10,0 | -,102604563555600 | ,056665057980589 | ,070 | -,213693254450029 | ,008484127338829 |
| 6,0 | 1,0 | -,001813701649016 | ,067519449363811 | ,979 | -,134181822445925 | ,130554419147893 |
| 2,0 | ,075248142070323 | ,086552543912630 | ,385 | -,094433300771053 | ,244929584911699 |
| 3,0 | -,012366277530037 | ,082354053757472 | ,881 | -,173816814206463 | ,149084259146390 |
| 4,0 | ,080251887175585 | ,075431202248605 | ,287 | -,067626784602371 | ,228130558953541 |
| 5,0 | ,083057013064182 | ,070805274249481 | ,241 | -,055752784456722 | ,221866810585086 |
| 7,0 | ,083348254217154 | ,068025502990995 | ,221 | -,050011956537300 | ,216708464971607 |
| 8,0 | ,030018071609382 | ,065772921969459 | ,648 | -,098926079482664 | ,158962222701429 |
| 9,0 | ,098147700370535 | ,066585987943475 | ,141 | -,032390421289672 | ,228685822030742 |
| 10,0 | -,019547550491418 | ,054984826034350 | ,722 | -,127342240215484 | ,088247139232648 |
| 7,0 | 1,0 | -,085161955866170 | ,066034505676516 | ,197 | -,214618927250153 | ,044295015517813 |
| 2,0 | -,008100112146831 | ,085399196455805 | ,924 | -,175520481520870 | ,159320257227207 |
| 3,0 | -,095714531747191 | ,081141050448204 | ,238 | -,254787042979378 | ,063357979484997 |
| 4,0 | -,003096367041569 | ,074104967243900 | ,967 | -,148375028941453 | ,142182294858315 |
| 5,0 | -,000291241152972 | ,069390682076874 | ,997 | -,136327809488117 | ,135745327182173 |
| 6,0 | -,083348254217154 | ,068025502990995 | ,221 | -,216708464971607 | ,050011956537300 |
| 8,0 | -,053330182607771 | ,064247623784465 | ,407 | -,179284071541209 | ,072623706325666 |
| 9,0 | ,014799446153382 | ,065079748677742 | ,820 | -,112785777298174 | ,142384669604937 |
| 10,0 | -,102895804708572 | ,053150832463634 | ,053 | -,207095052159386 | ,001303442742242 |
| 8,0 | 1,0 | -,031831773258399 | ,063711569963112 | ,617 | -,156734758524122 | ,093071212007325 |
| 2,0 | ,045230070460940 | ,083615973130257 | ,589 | -,118694388878463 | ,209154529800343 |
| 3,0 | -,042384349139419 | ,079262085987316 | ,593 | -,197773255172284 | ,113004556893446 |
| 4,0 | ,050233815566202 | ,072042726055044 | ,486 | -,091001937314564 | ,191469568446969 |
| 5,0 | ,053038941454799 | ,067183889187189 | ,430 | -,078671332300815 | ,184749215210414 |
| 6,0 | -,030018071609382 | ,065772921969459 | ,648 | -,158962222701429 | ,098926079482664 |
| 7,0 | ,053330182607771 | ,064247623784465 | ,407 | -,072623706325666 | ,179284071541209 |
| 9,0 | ,068129628761153 | ,062721462795289 | ,277 | -,054832306534122 | ,191091564056428 |
| 10,0 | -,049565622100801 | ,050235636741261 | ,324 | -,148049790664546 | ,048918546462945 |
| 9,0 | 1,0 | -,099961402019552 | ,064550605521346 | ,122 | -,226509269777235 | ,026586465738132 |
| 2,0 | -,022899558300213 | ,084257032279377 | ,786 | -,188080778405412 | ,142281661804986 |
| 3,0 | -,110513977900572 | ,079938068534765 | ,167 | -,267228110077020 | ,046200154275876 |
| 4,0 | -,017895813194951 | ,072785787784774 | ,806 | -,160588297220997 | ,124796670831096 |
| 5,0 | -,015090687306353 | ,067980081585156 | ,824 | -,148361851923856 | ,118180477311149 |
| 6,0 | -,098147700370535 | ,066585987943475 | ,141 | -,228685822030742 | ,032390421289672 |
| 7,0 | -,014799446153382 | ,065079748677742 | ,820 | -,142384669604937 | ,112785777298174 |
| 8,0 | -,068129628761153 | ,062721462795289 | ,277 | -,191091564056428 | ,054832306534122 |
| 10,0 | -,11769525081954\* | ,051295572175461 | ,022 | -,218257363824136 | -,017133137899771 |
| 10,0 | 1,0 | ,017733848842402 | ,052501599754594 | ,736 | -,085192614033522 | ,120660311718325 |
| 2,0 | ,094795692561741 | ,075424696168742 | ,209 | -,053070224408922 | ,242661609532404 |
| 3,0 | ,007181272961381 | ,070567216926048 | ,919 | -,131161826432661 | ,145524372355424 |
| 4,0 | ,099799437667003 | ,062349083450114 | ,110 | -,022432468657231 | ,222031343991237 |
| 5,0 | ,102604563555600 | ,056665057980589 | ,070 | -,008484127338829 | ,213693254450029 |
| 6,0 | ,019547550491418 | ,054984826034350 | ,722 | -,088247139232648 | ,127342240215484 |
| 7,0 | ,102895804708572 | ,053150832463634 | ,053 | -,001303442742242 | ,207095052159386 |
| 8,0 | ,049565622100801 | ,050235636741261 | ,324 | -,048918546462945 | ,148049790664546 |
| 9,0 | ,117695250861954\* | ,051295572175461 | ,022 | ,017133137899771 | ,218257363824136 |

1. A fiduciary duty is an obligation to act in the best interest of another party. For instance, a corporation's board member has a fiduciary duty to the shareholders, a trustee has a fiduciary duty to the trust's beneficiaries, and an attorney has a fiduciary duty to a client (US Legal, 2015). [↑](#footnote-ref-1)
2. Public firms reduced the percentage of bonus contingent to financial performance, where financial performance is interpreted as the measure for CFO’s managerial performance. [↑](#footnote-ref-2)
3. For example: “physical appointments of the office, the attractiveness of the office staff, the level of employee discipline, the kind and amount of charitable contributions, personal relations with employees, a larger than optimal computer to play with” (Jensen & Meckling, 1976). [↑](#footnote-ref-3)
4. “All out-of-pocket, monetary costs required to design and implement the control system such as cash bonuses or the costs of maintaining an audit staff” (Merchant & Van der Stede, 2007). [↑](#footnote-ref-4)
5. “Costs of control caused by any number of harmful side effects, including behavioural displacement, gamesmanship, operating delays, and negative attitudes” (Merchant & Van der Stede, 2007). [↑](#footnote-ref-5)
6. “Direct form of control by making the actions themselves the focus of control, such as behavioural constraints, pre-action reviews, action accountability, and redundancy” (Merchant & Van der Stede, 2007). [↑](#footnote-ref-6)
7. “Controls by mutual monitoring, such as a powerful form of group pressure on individuals who deviate from group norms and values” (Merchant & Van der Stede, 2007). [↑](#footnote-ref-7)
8. “Personnel controls build on employees’ natural tendencies to control or motivate themselves. [↑](#footnote-ref-8)
9. “Clear and unambiguous articulation of what needs to be done”(Kerr & Landauer, 2004). See chapter 2.3 for CFO responsibilities. [↑](#footnote-ref-9)
10. Until 2005, it was not compulsory for firms to account for stock option plans as an expense that decreases earnings. This flaw in the accounting rules resulted in firms to grant options rather than other forms of compensation that would cause an accountable expense. [↑](#footnote-ref-10)
11. Revenues that have been earned, but are not yet recorded in the accounts and expenses that have been incurred but are not yet recorded in the accounts. Accrual earnings is regarded as a superior measure of firm performance than cash flows because it mitigates timing and mismatching problems inherent in measuring cash flows over short intervals (Dechow, 1994). [↑](#footnote-ref-11)
12. A material weakness must be reported if there is more than a remote chance that a material error could results from the deficiency (Ramos, 2004). [↑](#footnote-ref-12)