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What is the effect of turnover on executive compensation?

An empirical study on firms listed on the Dutch AEX or German DAX during the period 2008-2012.

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Preface

After having finished my Bachelor in Economics and Business Economics and Master Financial Economics (both at Erasmus University) I had one Master left to finish: Management and Organizations. On top of that, I started to work in the IT-sector for Qquest B.V.[1] Combining my work with the process of writing this thesis led to the fact that writing this thesis took longer than assumed in the beginning. However, despite of this, I managed to finish this thesis successfully and focus on my working career.

First of all I would like to thank Dr. S.V. Kapoor for his guidance and patience. Furthermore, I would like to thank my family for their support, trust and advice during this period. I hope you all enjoy reading this thesis.

[1] www.qquest.nl

Abstract

The information provided in this thesis focuses on the effect of turnover on the relationship between executive compensation and firm performance for executives of firms listed on the Dutch AEX Stock Exchange and German DAX Stock Exchange. This relation is tested by conducting regression analyses to test four hypotheses. Results show that not only a positive relation between the stock returns and executive compensation, but also the significant influence of stock options on the relation between stock returns and executive compensation. Also, revenues show an even stronger significant effect on executive compensation. Finally, controlling for turnover, results show an even stronger effect of these variables on the executive compensation, indicating that turnover has a significant effect on the relation between executive compensation and firm performance.

This thesis contributes to the research conducted so far by providing results on the relationship between executive compensation and firm performance for firms listed on the AEX and DAX. Hereby a comparison is made between board members and CEOs and between different age groups. These results add to the relative scarcity of research for executive compensation on European listed firms. Furthermore, these results can be used to compare the results from studies on executive compensation of U.S. listed firms.

Keywords:

AEX, DAX, Executive Compensation, Agency Theory, Turnover, Firm performance

JEL classification:

G1, J3, J5, M5

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1 Introduction

The large increase in compensation pay for executives has attracted the attention of researches on the executive compensation, leading to not only more international discussions across several media platforms, but also to an increase in academic research.

From the 80s more research is conducted regarding executive compensation, since more emphasis is put on using the agency theory to explain the relation between executives and shareholders. An important study who delivered pioneering work in this area is from Coughlan and Schmidt (1984), who studied the relation between executive compensation and firm performance. They focused on the effectivity of internal control mechanisms used by shareholders to control executives. They found that a lack of successful internal control mechanisms may lead to turnover[2] in executive positions due to outside forces, such as mergers, acquisitions and takeovers. Another important study is from Murphy (1999), who focused on the incentives used in order to align the incentives of the shareholders and executives. He found a significant relation between executive compensation on the one hand and salaries, firm performance and stock options on the other hand.

However, little research is conducted on the effect of turnover (executive change) on the executive compensation. A famous paper that does focus on this area is from Coughlan and Schmidt (1984). The main goal of this thesis is to provide insights in this effect of turnover on executive compensation for firms listed on the AEX or DAX. The research question is: "*What is the effect of turnover on executive compensation?*"

To answer this research question, a regression model will be applied, whereby first of all the relation between executive compensation and firm performance is analyzed. Firm performance is measured by the *cumulative abnormal returns* (CAR) (MacKinlay (1997). After analyzing this regression, it will be extended by incorporating the stock options into the regression. These stock options will be added as a dummy variable, since the value of the options is not available. This dummy variable will be interacted with the CAR. Results from this interaction term show whether the effect of firm performance (CAR) on executive compensation is different when executives also have stock options incorporated into their compensation plan. Serfling (2013) found that stock options are mostly included in the compensation of young executives to not only incentivize them to perform better, but also to keep them within the firm. Finally, the regression will be extended using the revenues. Results from this will provide evidence for the effect of revenues, compared with CAR, on the compensation.

[2] Turnover = change of executives.

Eventually, same regressions will be conducted again, but then only for observations where no turnover occurred. Hereby the firms are chosen in which no change in executives occurred for at least two consecutive fiscal years. By analyzing these results, it is possible to see the effect of these independent variables on total compensation. To test for this turnover again, a logit regression will be used, whereby turnover is the dichotomous dependent variable and *Residual*, *Age* and CAR the independent variables.

In this thesis different age groups are considered in order to find out whether age also has an impact on executives. Adding on to this, by dividing the observations into different age groups more insights can be given in possible differences between different age groups in terms of slope of coefficients.

Finally, also a comparison between *board members* and *CEOs* is made, which provides evidence for any differences in compensation between these two groups. By this more can be known regarding the compensation structure and weights put on the variables that determine the compensation level for both groups.

The data used in this thesis consists of executive information regarding their compensation structure, tenure and age. Furthermore, also information regarding firm performance and firm revenues is collected. The reason for choosing this dataset is that it is the most complete dataset available from one specific source. Other dataset have less complete information regarding executives of European firms. Furthermore, for the same reason only executive information of firms listed on the AEX and DAX is chosen, since other European stock exchanges have less complete data. Another reason for choosing this dataset is due to the fact that it is the most up-to-date available data regarding executives of European firms that is available and concentrated in one period: 2008-2012, while other sources provide data that is dispersed among several years.

Results show that a significant relationship exists between executive compensation and firm performance. Hereby differences between the *young* and *old group* can be found, seeing a higher coefficient, and thus effect, of CAR on executive compensation for the *young group*. Also, results show that including stock options into the compensation plan do significantly influence the relationship between firm performance and executive compensation. Hereby also is shown that this effect is higher for the *young group* compared to the *old group*. Furthermore, results also show that revenues have a significant influence on the compensation plan. This influence however, is higher for the *old group* compared to the *young group*.

After controlling for the turnover effect and conducting a log regression, results show that turnover does have a significant effect on executive compensation. Hereby the relation between turnover and

executive compensation is negative, indicating that a higher degree of turnover within a firm leads to a lower executive compensation.

These results contribute to the existing literature regarding executive compensation by adding evidence for executives of firms listed on the Dutch AEX and German DAX. These results show similarities and differences between studies conducted on U.S. firms. Also, these results contribute to the relatively less research conducted on executive compensation of European firms and therefore can be used and extended for further research on executive compensation of these European firms.

The next chapters of this thesis will focus on the following: chapter 2 will focus on the literature review of executive compensation, whereby the focus will be put on several compensation components that are also used in the regression analyses conducted in this thesis. Also focus will be put on explaining the agency theory used in many studies conducted. Finally, also emphasis will be put on the relationship between turnover and firm performance. In chapter 3 the data used in this thesis will be discussed. In chapter 4 the methodology used to conduct the research will be discussed, followed by discussing the results in chapter 5. Chapter 6 will give a brief summary on the results found in this thesis. Also drawbacks found in this thesis will be discussed, followed by recommendations for further research.

2 Theoretical review

Executive compensation plans mostly exist of the following four components: a base salary fee, an annual bonus, stock options and long-term incentive plans (Murphy, 1999).[3] There is an existing increase in the different pay components of executives. Understanding these components will be useful to understand the weight given to them when structuring the executive compensation plan, whereby the agency theory is involved. Therefore in section 2.1 the focus will be on the first three before mentioned pay components. In section 2.2 the focus will be set on the agency theory and its influence on setting the executive compensation plan, since compensation plans are designed in order to align the executives' interest with those of the shareholders. Besides explaining the agency theory, also its limitations and alternative agency theory is discussed. In section 2.3 the focus will be on the relation between turnover and firm performance, since the probability of turnover increases when executives perform poorly, which is measured by the firm performance, but also other variables. This will be discussed in this section. Section 2.4 finally gives a summary of this chapter.

2.1 Executive compensation components

2.1.1 Base salary

Executives' base salary is mostly determined by investigating the general salary given within the specific industry the firm operates is active in. Hereby firms use this data and control for firm size to determine the level of the base salary (Murphy, 1999). However, this control for firm size is criticized, since other factors, such as age, experience, level of education and productivity, are neglected. Furthermore, firm size does not provide insights in the level of skills required and complexity of the work (Murphy, 1999).

The base salary is an interesting topic for researches to investigate, since it is an important component in the executive's total compensation. This base salary is seen as a "fixed component" of the total compensation of executives. This is due to the fact that the volatility of the level of this base salary is relatively small compared to other compensation components, such as bonuses (Murphy, 1999). Secondly, risk-averse executives have a preference for this component. Risk-averse executives take relatively less risk than risk-seeking executives, avoiding the possibility of taking the wrong decisions, which lead to poor firm performance. This then negatively influences their compensation. Even though they are compensated for the risk they take, risk-averse executive do not want to perform bad and being fired. Therefore, they prefer an increase in the base salary over an increase in the level of bonus or stock options (Murphy, 1999).

[3] In thesis only the first three components will be discussed due to the lack of data available regarding the fourth component. For the second component, only information whether the executive has stock options included or not is given.

2.1.2 Bonuses

Besides the base salary, the executive compensation also consists of the bonus component. This bonus is paid annually and based on the firm's performance during the specific year. It consists of three components: performance measures, performance standards and the pay-performance relation structure (Murphy, 1999).

2.1.2.1 Performance measures

Murphy (1999) showed that more than a half of the firms use more than one single performance measure to determine the level of compensation of executives. Firms that use a single performance measure, often choose for an accounting variant, such as revenues, net income, earnings before interest and taxes (EBIT) or economic value added. However, firms that use multiple performance measures, choose also a variant a per-share basis, such as earnings per share (EPS), return on equity (ROE).

Besides the economic performance measures, also other non-economic performance measures are used, such as "Individual performance" measure, whereby the executive performance is measured with the beforehand established goals. Other non-economic measures are for example customer satisfaction. Zuriekat, Salameh and Alrawashdeh (2011) showed that firms benefit from using a combination of financial and non-financial performance measures. They found that the higher the diversity level in performance measures, the higher the satisfaction among firms.

However, even though accounting data is widely used to determine bonuses, they do have their limitations. First of all, accounting data is outdated and provides information on the short run bases. Secondly, accounting data can be manipulated by executives in order to show favourable results (Hopwood, 1972; Griffin and Wright, 2015). Revenues are based on the firm's performance in the previous year and are not a good representation of its performance for the next year. Thereby, executives can move costs made in this year to the next year in order to show better results for the current year.

2.1.2.2 Performance standards

The performance standards for each performance measure are based mostly on one single criterion. The most common used criteria are the budget, prior-year, discretionary and peer group standards. The budget standards are based on the budget goals set by a firm. The prior-year standards focus on the annual growth of the firm (growth of profits, EPS etc.). Discretionary standards are subjectively set by the board of directors based on the review of the firm's performance. The peer group standards are determined by comparing the firm performance with the performance of other competitors (Murphy, 1999).

Setting performance standards may create incentives for the "s*andbag effect*", whereby executives limit the expectations the firm has regarding their capabilities. By this they can perform better than expected by the firm and show better results than expected by the firm, leading to a better position of the executives (Zamora, 2009).

Another effect of setting performance standards is the "*ratchet effect*", whereby executives do not show a good performance now, since they know that performing better now will lead to higher, and probably more difficult to meet, performance standards later (Bol and Lill, 2015).

2.1.2.3 Pay-performance structures

The most used pay-performance measure is the 80/120 plan. Hereby bonus is only paid when the performance meets the limit of 80% of the performance standard and stops to increase if the level of performance reaches 120% of the performance standard (Murphy, 1999).

Murphy (1999) showed that most of the firms still pay bonuses, despite the act that firm performance does not meet the minimum performance limit. However, even though these firms keep paying bonuses, most of them implement a bonus cap. Furthermore, he showed that incorporating a cap is most likely to occur for firms in the industrial sector relative to firms in the financial sector.

In figure 2.1 below the pay-performance structure of the bonuses is shown (Murphy, 1999). As can be seen, executives will start receiving a bonus if they meet a certain minimum level of performance ("Performance Treshold"). For every higher performance above the "Performance Threshold" they will receive a variable bonus based on the level of the performance. This variable pay-performance zone (The "Incentive Zone") is capped at a certain level (Bonus "Cap"), which is the total maximum bonus executives can receive. The target bonus is the bonus based on the standard performance target set by the firm for executives.

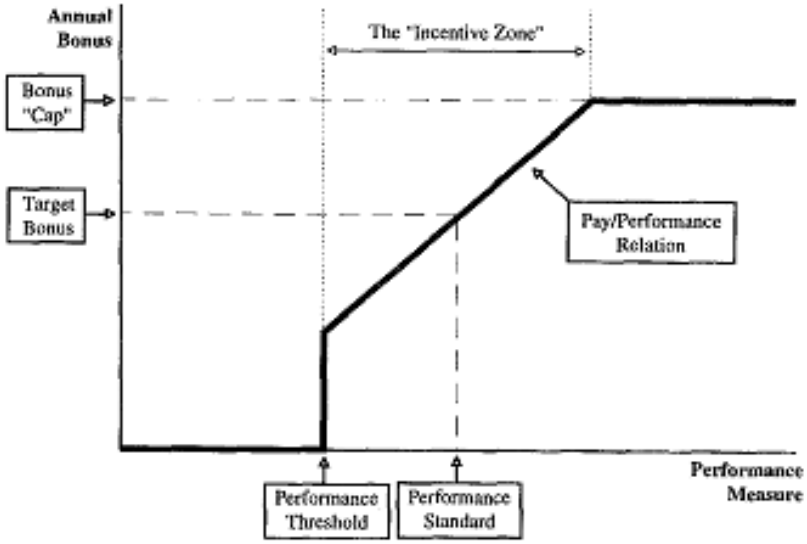

Figure 2.1: Example of an annual incentive plan.

A disadvantage of the pay-performance structures is the fact that, if executives will not meet the minimum level of performance to receive the bonuses, they can “reserve” the profits made this year and keep them for the profits for next year (Healy, 1985).

2.1.3 Stock options

Stock options given to executives provides then with the option to buy stocks at a pre-determined exercise price during a pre-determined period. These stock options are not tradable and should be exercised within the pre-determined period. Hereby, stock rewards consist with of the stock price appreciation and are not linked with the shareholder returns (Izhakian and Yermack, 2014; Chang, Fu, Low and Zhang, 2015). The main reason for providing stock options to executives is in order to align the interest of executives with those of the shareholders, since stock options are a link between executive compensation and firm stock-price performance (Hall and Murphy, 2003).

Murphy (1999) showed that almost two-third of the firms provide stock options in the compensation plan. Hereby, the exercise price is measures as the fair market value. Furthermore, he found that most of the stock options have a pre-determined period of 10 years, which is also shown by Izhakian and Yermack (2014).

Since the value of stock options increases with the stock price appreciation, executives invest in more risky projects than needed, increasing the performance risk of firms (Chang et al. 2015). Another

disadvantage is that when stock options depreciate below the exercise price, this will lose the incentives for executives. To avoid this, stock options given for executives should be repriced again (Chang et al. 2015).

As Murphy (1999) and Hall and Murphy (2003) showed, there is an increasing trend in stock options. Hall and Murphy showed an increase in value of stock options from 22 million dollars per firm to 238 dollars per firm. Hereby, CEO stock options pay increased from 3.5 million dollars to almost 15 million dollars in the period 1992-2000. Looking at the average increase of stock options, Hall and Murphy (2003) showed an average increase of 9 times for stock options, while other compensation components did not even had a growth of one third of the growth of the stock options.

In their "CEO Pay Strategy Report 2014" Equilar[4] provided an overview of the level of compensations and compensation structures for the year 2014. Hereby they also examined the change in the period 2009-2013. Their focus hereby was on companies listed on the S&P 1500 and S&P 500 firms.

In their report they also showed an increasing trend in stock options, which was higher than the change for other components. Figure 2.2 below (Equilar 2014), the change in the compensation components for the S&P 500 firms for the period 2009-2013 is given. Focusing on the performance stocks, it can be seen that they had a larger growth (trend) compared to the other components. Furthermore, it can be seen that they also make a large part of the compensation received by executives. This is also shown by Equilar. Figure 2.3 (Equilar, 2014), shows for the different sectors and S&Ps the compensation structures. As can be seen, in all the sectors and S&Ps stock options are the most component of the total compensation given to executives.

[4] www.info.equilar.com

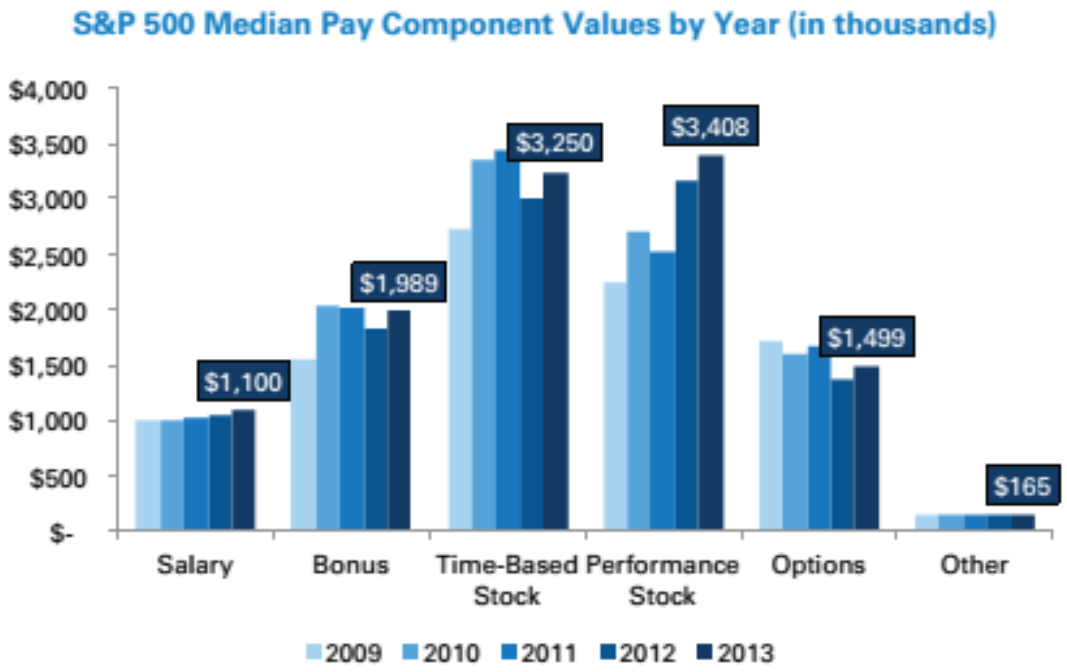

Figure 2.2: Change in median pay components for the S&P 500 firms for the period 2009-2013.

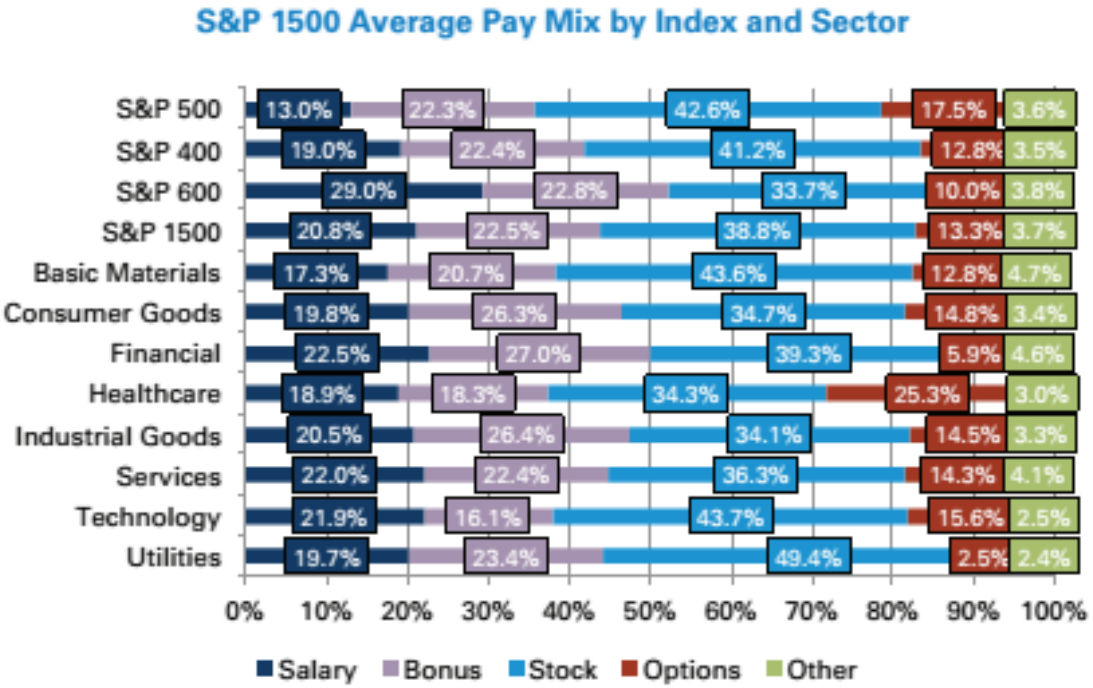

Figure 2.3: Percentage of the pay components of the total compensation per industry and per S&P.

Hall and Murphy (2003) and Murphy (1999) provided a couple of reasons for this increase in stock options. First of all, they found that granting options are free of taxability, both for the firm as for the executive. Thereby, most of the options are non-qualified options, since, contrary to qualified options, firms can deduct compensation expenses as operating expenses when the options are exercised (the difference between the market and exercise price is income that is taxable for the executive). Furthermore, non-qualified options provide more flexibility for the firm with regards to whom they provide these options.

Another reason for this increase is the attack on wealth in the 80s, as discussed in chapter 1. The criticism given to the high level of executive compensation is that there is a lack of explanation for this high amount of compensation. Also, hardly any penalties were given for failures. The most important goal of this wealth attack was to reduce the level of compensation given to executives. However, the effect of this was that there was a change in the compensation structure of executives, whereby more emphasis is put on the relation between performance and pay, introducing bonuses and stocks as compensation components.

2.2 Agency Theory

As stated in the introduction, agency theory is used to align the executive interests with those of the shareholders by introducing incentives to the executives. This theory has been an important topic for research since academic research is publicized by i.e. Spence and Zeckhauser (1971) and Ross (1973).

According to this theory, there is a monotonically relation between effort and motivation on the one hand and effort on the other hand, whereby a straight increasing line can be visualized from bottom left to top right.

This agency theory focuses on the costs ("*agency costs*") that arise due to possible conflicts in interest between principals (shareholders) and agents (executives). Jensen and Meckling (1976) and Pepper and Gore (2015) stated that agency costs are for example the sum of monitoring expenditures and loss in welfare due to the difference in interests between these two parties. This theory therefore suggests that agency costs can be reduced by providing incentive contracts and monitoring costs to align their interests together. In addition, Eisenhardt (1989) explained this more by formalizing that, first of all, when contracts are outcome based, agents are more likely to align their interests with those of the principal. Secondly, in situations in which principals have information that verify the behaviour of the agent, agents are more likely to behave as preferred by the principals.

Even though this theory is mainly used for the research on executive compensation, it still has its limitations (Frydman and Jenter, 2010; Tosi, Werner, Katz and Gomez-Meija, 2000; Roberts, 2010). Roberts (2010) has provided evidence for the weak relation between incentives and executive performance during the financial crisis. As a result, Pepper and Gore (2015) provided a new, adapted agency theory ("*Behavioral agency theory*") to explain the relation between executive compensation, firm performance and shareholders' interests.

According to this behavioural agency theory the initial agency theory is too simplistic, since it does not take into account the agent's motivation and work ability. Therefore, this behavioural agency theory changes the initial agency theory on four different areas (Pepper and Gore, 2015).

The first modification made is that more emphasis is put on maximizing the agent performance and work motivation relative to the focus of the initial agency theory, namely aligning the interests of agents and principals. According to the behavioural agency theory, motivation of agents does not depend in incentives, but are independent. Therefore, incentives might even reduce motivation instead of increase it. An example is the "*crowding out*" effect (Wiseman and Gomez-Meija, 1998), whereby providing incentives for agents will only motivate high performing agents, while poor performing agents will withdraw themselves sooner, since they already know they will not be able to compete against the better performing agents.

The second motivation relates to the agent's risk preference. Hereby the prospect theory is incorporated (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). According to this theory, agents have a reference point, which they use to calculate their gains and losses. This reference point is different for each individual. Below the reference point agents are loss averse, indicating that they prefer avoiding losses over receiving gains. Therefore, the line below the reference point is therefore steeper than the one above the reference point. Above the reference point agents are risk averse, meaning that they do not like to take much risk.

The third modification focuses on time preferences. This means that the further away rewards are, the more heavily they are discounted, which provides them with the option to adjust their preferences when needed (Pepper and Gore, 2015).

The fourth and last modification made focuses on agent's perception of equitable comparison (Pepper and Gore, 2015). This means that if agents find that their effort they pun in their work, is fairly rewarded, they will stay motivate and will keep putting at least the same level of effort in their work. However, if this is not the case, then they will become demotivated. Hereby agents use personal referents and market normal to have a benchmark to compare with. This is called the "*inequity aversion*" and means that individuals prefer fairness and do not like inequalities.

2.3 Executive turnover vs firm performance

Besides the increase in interest regarding the executive compensation, also a growing interest exist sin the relation between turnover and firm performance, and more specifically, the turnover of CEOs. Previous research found an negative relation between firm performance and turnover, whereby the turnover probability is higher when most of the board members are outside directors. This negative relation has always been seen as the evidence for the fact that CEOs are replaced when they perform badly.

Besides the turnover based on poor performance, also turnover exists in the form of retirement by executives. Murphy (1999) showed that most of the executives retire at the age of 64-65, which can also be seen as the mandatory retirement age, since the age of 65 is generally seen the retirement age in the labour market. He illustrated this with figure 2.6 below.

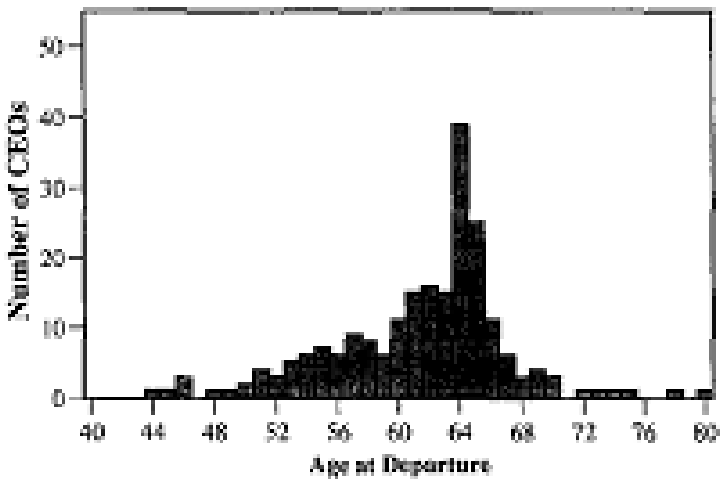

Figure 2.4: Age and turnover of CEOs by age.

2.4 Summary

As can be seen, different components are used to determine the level of compensation, whereby the most important discussed here: base salary, bonuses and stock options. From these three, stock options showed the largest increase and are at the moment the most important component in determining the compensation level. These bonuses and stock options implemented together with the base salary are due to incentivize the executives to perform in favour of the shareholders' goals. This is described in the agency theory, which describes that aligning the goals of the executives with those of the shareholders is the best option. To do so, providing incentives and increasing monitoring

costs to control executives, are two important elements. However, this agency has been criticized due to the fact that it neglects the executive's work ability and motivation. Therefore, the behavioural agency theory is introduced, focusing on the motivation of the executive as an important factor that influences its performance. This performance of the executive is important, since it influences also the performance of the firm. If the firm performs badly, these executives are more likely to be replaced. This increase in the probability of turnover is shown to be linked with firm performance, showing that a poor firm performance increases the probability that executives are fired.

3 The Data

In this chapter the data will be elaborated on. Hereby, brief overview of the data collected will be given (test sample). Furthermore, the focus will be on elaborating on the criteria used in order to decide which data to include in this research.

To test the before mentioned hypotheses, the test sample used in this thesis contains information regarding the executives[5] and their total compensation. Hereby the focus is put on executives of firms listed on the Dutch AEX Index or the German DAX Index. This information is collected from the Executive Compensation Database[6], in which the executives' identity and their total compensation are provided for the period 2008 - 2012. Furthermore, the database also provides information whether executives have stock options as part of their total compensation.[7] Also, this database also provides information regarding the firm's revenues for each specific fiscal year. Finally, also the daily actual and expected earnings announcements are collected for each firm for every specific fiscal year. This data is collected from the Datastream Event Study Tool, available on the Erasmus University Rotterdam (EUR) and will be used in order to calculate the *daily abnormal returns*.[8] Hereby ISIN codes for all the companies listed on these two Stock Exchanges are collected from Compustat (WRDS). The main goal of this thesis is to find evidence in the relation between turnover and executive compensation.

The test sample used in this thesis consists of 55 firms of which 25 are listed on the Dutch AEX Index and 30 are listed on the German DAX Index. From these 55 firms 901 executive observations are collected. Of these observations, 759 are board members, while 142 are CEOs.

Elaborating on the observations, each observation contains the following information (variables), which is shown in the table below. Dividing this sample among the fiscal years, the sample has 182 observations for 2008, 177 observations for 2009, 179 observations for 2010, 178 for 2011 and 185 for 2012.

[5] With executives is referred to both the board members and CEO's. If necessary, both groups will be mentioned separately.
[6] www.pedersenandpartners.com
[7] The value of the stock options is not integrated into the total compensation, which exists only of the salary and bonus. The database only shows whether the executive has stock options or not.
[8] See chapter 4 Methodology for the calculations.

Data variables	Description
Year	The data collected is from 2008 till 2012 and are fiscal years.
Company	Firm name.
Industry	The industry within the firm operates.
Executive name	Name of the executive.
CEO	Shows whether the executive is a CEO or not for the specific year.
Total compensation	The compensation executives receive for a specific fiscal year and consist of the salary plus bonus.
Stock options	Shows whether the executive also has stock options in the specific fiscal year.
Executive age	Age of the executive in the specific fiscal year.
Revenues	The total revenues of the firm for a specific fiscal year.
Abnormal stock returns	Expected stock returns – actual stock returns.

Table 3.1: This table gives a brief explanation of the collected information (variables) from the Executive Compensation Database and Datastream database.

To incorporate data in the test sample, the data should meet several conditions. These conditions are in line with the conditions used in Coughlan and Schmidt (1984). The first condition to be met is that the stock price data must be available from the Datastream database. This stock price data is important in order to test our hypotheses. Another condition to be met is that the executives must be member of the firm for at least two consecutive fiscal years, in which the second year must be fiscal in the period 2008-2012. This second condition must be met, since the dependent variable is the rate of change in the total compensation. Adding on to this, two fiscal years are added to the sample only if the total compensation data for the fiscal years reflects the total compensation for complete fiscal years. The final condition that is necessary to be met is that the firms must be listed either on the Dutch AEX Index or the German DAX Index in the period 2008-2012. Since the acquired firm is not listed anymore on the Stock Index, changes in management are difficult to measure. Therefore, data is excluded in which an acquisition occurred.

After filtering the data using these conditions, the test sample consists of 901 observations from the initial 941 observations. Most of the data excluded from the test sample is due to the fact that the second condition has not been met. In the table below the summary statistics of the numerical data is provided, which gives insights about the numerical variables used.

Summary statistics						
	Statistics					
Variables	Mean	Median	Std. Dev.	Minimum	Maximum	Observations
Compensation	1,788,782	1,511,955	1,615,998	9000	27,834,800	901
Age	53.496	54	6.145	35	70	901
Revenues[1]	56,727	47,367	66,462	2,062	481,700	901
CAR[2]	0.183	-0.001	0.0174	-0.032	0.0574	901

[1] (x 1,000,000)

[2] CAR: Cumulative Abnormal Returns

Table 3.2: A summary statistics of the variables

Elaborating on this data in table 3.2 above, the compensation variable is the dependent variable in this thesis, of which the rate of change will be calculated. The age variable is used to understand its effect on total compensation. Furthermore, it is used in order to explain the effect of age on the executive or CEO specific turnover. Furthermore, Revenues are important in order to provide information on the strength of the effect of firm performance (revenues) on total compensation. This is important for these companies because due to governmental regularities the salaries and bonuses of executives are controlled in a higher frequency since the financial crisis in 2008, leading to a 'freeze' in compensation movements across the years after the financial crisis (Kim, Li, Ma, Song, 2013). Finally, the CAR variable provides insights in how much the total compensation is affected by the abnormal stock returns. Hereby the cumulative abnormal daily stock returns are calculated.[9]

In their research, Coughlan and Schmidt (1984) divided their test sample into two categories on the basis of the relation between age and the probability of CEO turnover. By this they tried to avoid complications that might affect turnover effects, whereby the focus is on the provisions given for obligated retirement at the age of 65. These provisions, combined with the compensation effects, make it more difficult to conduct research upon the relationship between firm performance and the rate of change of total compensation, since they will have an impact on this relationship.

In order to avoid these complications which might affect the test analyses conducted in this research, it is important to test for this. Therefore, it is important to analyze the relationship between age on the one hand and executive and CEO turnover on the other hand. Hereby the occurrence of a turnover with regards to executives or CEOs is recorded when the executive (CEO) recorded in a specific fiscal year is not present in the next fiscal year.

[9] More about the Cumulative Abnormal Returns (CAR) in chapter 4: Methodology.

Table 3.3 below shows the turnover frequency[10] of executives on the one hand and CEOs (in brackets) on the other hand. This division is made in order to provide insights in the difference in turnover between CEOs, who have the responsibility regarding firm performance, and executives, whose main task is to monitor the CEO's activities. Focusing on the board members, it can be seen that turnover frequency is 0.75000 and 0.6667 members of the board with the age of 64 and 65 respectively. This means that turnover occurs in not even every two cases for both years. This substantially increase in turnover frequency after the age of 63 might explain the occurrence of mandatory retirement provisions, since most board members leave their position prior or at age 65[11]. Adding on to this, research from Yermack (2006) has shown that the average age whereby turnover exists is around 63. Even though the table below shows that the highest turnover frequency is at the ages 64 and 65, it can be seen that the turnover frequency starts to increase at the age of 63.

Focusing on the CEO turnover frequency, it can be seen that at the age of 64 the turnover frequency (0.2000) substantially starts to increase. Just as for the board members, these results explain the existence of mandatory retirement provisions. Comparing these results with the results of Yermack (2006), it can be shown that CEOs leave their position prior their age of 65. However, the results in this thesis show a further increase in CEO turnover frequency beyond the age of 65, indicating that CEOs older than the age of 65 are replaced in a more frequent manner. An explanation for this increasing turnover frequency is that firms try to avoid keeping CEOs for a long period in order to stay competitive (Sipek, 2014). According to her, CEOs who stay in the lead for a long time have difficulties keeping up with the highly changing environment, while their skills and capabilities aren't changing at the same speed. This eventually will lead to a negative performance of the company.

Comparing these results with the results of Coughlan and Schmidt (1984), it can be concluded that also in this research the turnover frequency substantially increases at the age of 64 for both the executives as the CEOs. Therefore, based on this information, a division of the test data is made into two groups, whereby the first group consists of executives (board members and CEOs) younger than 64 years, while the other group consists of executives older than 63 years. For board members younger than 64 years, the probability of turnover is almost one fourth. For board members equal to or older than 64 years the probability of executive change is almost one third. For CEOs this is one fourth and one ninth respectively. From these results can also be concluded that an negative relation exists between age and turnover. However, more regarding this relation can be found in chapters 4 and 5.

[10] Note that in this research no division is made between voluntary and forced turnover.
[11] Whether it is voluntary or forced.

These probabilities are calculated using the following formula;

$$Probability\ of\ \Delta = \frac{\#\ Obs_{(t+1)}}{\#\ Obs_{(t)}} \quad (1)$$

Whereby Δ stands for 'change', # for the number of observations and Obs for observations.

Executive* turnover frequency by age for 901 executives in 55 firms in the period 2008-2012			
Age of CEO in year t	Number of observations in sample	Number of observations with different executive/CEO in year t + 1	Turnover frequency
>65	16 (6)	2 (2)	0.1250 (0.3333)
65	9 (2)	6 (0)	0.6667 (---)
64	12 (5)	9 (1)	0,7500 (0,2000)
63	19 (7)	6 (1)	0.3158 (0.1429)
<63	845 (122)	199 (13)	0.2355 (0.1066)
All ages	901 (142)	222 (17)	0.2464 (0.1197)
* Results in brackets (…) refer to CEOs only.			

Table 3.3: This table presents the executive turnover frequency for 901 executives active in the 55 firms listed on the Dutch AEX Index and the German DAX Index in the period 2008-2012.

Therefore, in order to avoid statistical problems that might occur due to the effect of provisions for mandatory retirement combined with compensation effects, it is important to make this division. By this the probability that these statistical problems can occur in the younger group (< 64 years) is lower compared to the older group (≥ 64 years).

Continuing on this division, it is important to understand the size and pay characteristics of these two groups, which is shown in table 3.4 below.

Focusing on the two age groups, it can be seen that the group of executives who are 63 years or younger (table 3.4A) is more than 9 times larger than the older group of executives (table 3.4B). Hereby it must be noted that executives can appear in both groups. For example; if an executive is 63

years old in the fiscal year 2008, it will be part of the younger group. However, for the fiscal year 2009 the executive will be 64 years old and therefore part of the older group.

Comparing the two age groups, it can be seen that the CAR is relatively larger for the younger group. This is also consistent with the salaries of the two groups, in which the younger group receives a relatively larger pay, despite the small differences. These differences can be explained by the results provided by Sipek (2014), as stated earlier. Younger executives have more updated skills and capabilities and therefore are more able to keep up with the rapidly changing environment, resulting in a better firm performance (higher CAR, which then leads to a higher reward (pay). Furthermore, Serfling (2013) showed that older CEOs take less risk than younger CEOs, which leads to lower stock performance and therefore lower compensation, while younger CEOs want to make career and thus are willing to take risks. He showed this by analyzing the relation between age and stock return volatility. Hereby he assumed that that an increase in stock return volatility is due to an increase in risk-taking behavior. He found a negative relation between age and stock return volatility, showing that the older the executive gets, the less risky he behaves.

Even though their research focused on CEOs only, this can also be used to explain these results, in which CEOs and board members are mixed, since they all are responsible for the firm performance as also stated by Gaur, Bathula and Singh (2015). According to them boards should have both a monitoring role (due to the agency problem) as an advisory role.

Mean and standard deviation of variables used in the empirical analysis, for each of the individual-year subsamples and the combined time-series cross-section sample.

Table 3.4A: Age ≤ 63

	t = 2008 N = 169	t = 2009 N = 171	t = 2010 N = 166	t = 2011 N = 153	t = 2012 N = 155	Combined sample N = 814
Mean of:						
Pay (t)	1,764,446	1,770,284	1,767,568	1,751,322	1,754,796	1,761,683
Pay (t – 1)	1,689,347	1,691,569	1,690,873	1,673,856	1,674,914	1,684,112
Deflated dln (pay)	0.0605	0.0606	0.0604	0.0605	0.0605	0.0605
CAR	0.1364	0.1582	0.1632	0.1592	0.1603	0.1573
Std. dev. of CAR	0.2188	0.3738	0.2828	0.1688	0.3107	0.2710

Table 3.4B: Age ≥ 64

	t = 2008 N = 17	t = 2009 N = 12	t = 2010 N = 19	t = 2011 N = 15	t = 2012 N = 18	Combined sample N = 87
Mean of:						
Pay (t)	1,663,057	1,662,331	1,691,241	1,782,208	1,792,057	1,718,179
Pay (t – 1)	1,573,854	1,583,383	1,603,247	1,643,593	1,649,368	1,610,689
Deflated dln (pay)	0.0017	0.0636	0.0608	0.0604	0.0604	0.0494
CAR	0.0265	0.0237	0.0153	0.0439	0.1369	0.0727
Std. dev. of CAR	0.2589	0.4152	0.4573	0.1839	0.2425	0.3116

Pay (t): total compensation (salary + bonus) in thousands of euros in year t.

Pay (t – 1): total compensation (salary + bonus) in thousands of euros in year (t – 1).

Deflated dln (pay): Ln CPI-deflated pay (t) – Ln CPI-deflated pay (t – 1) (2007 = 100).

CAR: *Cumulative Abnormal Return*: CPI-deflated sum of the daily abnormal returns over the firm's fiscal year.

Table 3.4: Size and pay characteristics of executives younger and equal or older than 64.

4 Methodology[12]

After having discussed the data, the focus in this chapter will be on the methodology used in order to conduct the research in this thesis. In this methodology the steps and calculations used in this thesis are briefly discussed. This chapter will be divided in into five sections. In these sections the methodology of testing the hypotheses mentioned earlier in this thesis will be discussed. In section 4.1 the hypotheses 1, 2 and 3 will be discussed. In section 4.2 hypothesis 4 will be discussed. In the last section (4.3) a brief summary is given. Before starting with the methodology for the hypotheses, first the hypothesis are given below:

Null hypothesis 1: *Excess returns have no impact on executive compensation*.

Null hypothesis 2: *There is no difference in impact of excess returns on executive compensation between executives with and without stock* options.

Null hypothesis 3: *Revenues have no impact on executive compensation*.

Null hypothesis 4: *Turnover has no impact on abnormal stock returns.*

4.1 Hypotheses testing

In this section the methodology of testing the following hypothesis 1, 2 and 3 will be discussed:

The regression model (which will be further adapted to test hypothesis 2 and 3) is as follows:

$$Ln\ TC = \alpha + \beta * CAR_{i,t} + \varepsilon_{i,t} \qquad (2)$$

Hereby the subscript i, t refers to firm i for fiscal year t. Furthermore, $Ln\ TC$ is calculated by taking the difference in the natural logarithm of the total compensation an executive receives for a fiscal year t and the previous fiscal year (*t-1*). This formula is as follows:

$$Ln\ TC = \frac{CPI\text{-}deflated\ total\ compensation_{i,t}}{CPI\text{-}deflated\ total\ compensation_{i,t-1}} \qquad (3)$$

[12] Note that the methodology is mostly similar to the methodology used by Coughlan and Schmidt (1984). However, some little adaptions or additions are made throughout the methodology. Though, this will be mentioned explicitly.

The *CAR* represents the cumulative abnormal return for a firm i over a specific year t and is calculated by taking the sum of the daily abnormal returns.[13] The daily abnormal returns are calculated by using the *Market Model* (MM).[14]

Finally, $\varepsilon_{i,t}$ is the residual from the compensation regression (formula 2) and serves as a measure for factors other than CAR that influence the total compensation. Hereby it is assumed that a positive residual indicates that other factors are considered when evaluating the compensation structure. This occurs when for example the stock performance was determined by factors on which the executives have no influence and that the executives should receive a higher compensation, since they performed better, despite the events occurred. A negative residual indicates that the executive is compensated more than he actually should have, looking at the CAR and occurrence of other factors. Therefore, a negative residual implies that the compensation is negatively adjusted for this.

Hypothesis 2 is tested by adding stock options into formula (2). Hereby stock options will be added as a dummy variable, whereby the value 1 indicates that the executive has stock options as part of his compensation plan, while the value 0 means that the executive does not have stock options as part of his compensation plan. Furthermore, this dummy will be added into the formula as an interaction[15] term with CAR, since expected that the CAR has a steeper slope for executives who have stock options compared to executives that do not have stock options, meaning that executives receive a relatively higher total compensation. If the results will prove what is being expected, then it can be concluded that stock options are an incentive that is used in order to motivate executives to perform better, resulting in a higher CAR and thus increasing shareholder value.

The third and last hypothesis in this section is tested by adding the percentage change in the CPI-deflated revenues per year into formula 2. Hereby it is assumed that adding revenues to formula (2) will not affect the CAR.

$$\%\ Revenues\ change = \frac{[Revenues_t - Revenues_{(t-1)}]}{Revenues_{(t-1)}} \quad (4)$$

[13] The daily abnormal returns are CPI-deflated by dividing the monthly CPI by the amount of trading days in that month.
[14] Besides the MM model, also the *Constant Mean Return Model* (CMRM) can be used. In this thesis no emphasis will be put on the difference(s) between these models. For further information please refer to Shamoun Poulus (2014). For further information regarding this model, see Appendix.
[15] From now on, the term 'interaction term' will be used to refer to the interaction between CAR and the dummy for stock options.

To test these hypotheses, regression estimates are made for three different groups of observations: *young*, *old* and t*urnover group*. First of all the first two groups are used, whereby for each group eight regressions are estimated, whereby formula 2 is used. The first 5 regressions are estimated by using formula 2, and apply to every performance fiscal year individual (2008 till 2012). In these regressions the stock performance variable is the CAR. The sixth regression is estimated by pooling the observations used in order to estimate the first five regressions. This sixth regression is important in order to compare overall results of the specific group with the results in every individual fiscal year. By analyzing the results of these first six regressions it is possible to test the first hypothesis, which states that there is a positive relation between total compensation and abnormal stock returns. In this seventh regression the second hypothesis will be tested, which states that stock options increase the effect of CAR on total compensation. Furthermore, the eighth regression will be used to test the third hypothesis, in which both the CAR and the Rev variables are included.

The third and final group of observations that will be defined based on firms that do not have an executive (and CEO by itself) turnover during the period examined in this thesis (2008-2012). Testing this fourth group is important in order to find out whether turnover has an effect on the total compensation. This regression is therefore the same as the one used in the reference paper of Coughlan and Schmidt (1984), who found out that changes in revenues turn out to have a significant influence on the compensation when no turnover occurs.[16]

Hereby formula 2 will be used, in which the focus will be on two groups: board members and CEOs. The reason for combining the fiscal years together is due to the fact that the goal is to find the effect of turnover on the compensation regression results and not the differences in the effect of turnover on the compensation regressions for the period 2008-2012. After controlling for the turnover effect, the observations left are sufficient and therefore representative enough to conduct the regressions on.

Elaborating on this, after deleting executives (and CEOs) based on the criterion that individuals who are not identified in the following fiscal year within the period 2008-2012, are excluded. Based on this, the sample consists of 646 board members and 38 CEOs when pooled together.

4.2 hypothesis 4

The fourth hypothesis stated that there is no negative relation between turnover and abnormal stock returns, whereby turnover occurs when the executive is not identified in the next fiscal years, indicating that he left his position.

[16] More explanation regarding these results see chapter 5 Results.

To conduct the empirical tests, a logit regression is used for turnover, whereby turnover is categorical dependent variable.[17] The value of 1 indicates that turnover occurs at a probability of 1 and a value of 0 indicates the opposite. Since the reference paper of Coughlan and Schmidt (1984) expected the sign of the coefficient of CAR to be negative, this is therefore also expected hereby. This negative relation indicates therefore that the higher the CAR is, the lower the probability that turnover occurs. Except the CAR variable, the logit regression also consists of the constant term, residual and age.

As found in table 3.3 in chapter 3, there is a positive relation between age and turnover, whereby the probability of turnover for executives equal or older than 64 years (*old group*) is higher than executives younger than 64 years (*young group*). To test hypothesis 4, three age groups are tested separately: < 63, 63 - 65 and > 65. The expectations are that the coefficient of age will be positive, indicating that an increase in age leads to an increase in the probability of turnover, due to the fact that executives come closer to the mandatory retirement age. Focusing on the three groups, the first group is the *young group*, while the second and third group resulted from splitting the *old group*. This second group (age 63 - 65) consists of executives that nearly reach or already have reached the mandatory retirement age of 65. The third group consists of executives that have exceeded the mandatory retirement age. The main reason for splitting the executives this time into three group is to find evidence whether the (slope of the) coefficient is larger as the age of executives increases, indicating that the probability of turnover reacts more heavily as age increases. This is different than the interpretation of age by Coughlan and Schmidt, who only focused on two groups: *young* and *old* group.

The residual term ($\varepsilon_{i,t}$) is the residual from the compensation regression (formula 2) and serves as a measure for factors other than CAR that influence the $Ln\ TC$ (Coughlan and Schmidt, 1984). Hereby, it is assumed that the sign of the coefficient of the residual changes from negative to positive as age increase, since it is expected that the older the executive, the more he is getting compensated for other factors than for CAR.[18] This is due to the fact that the older the executives, the higher the probability of retirement and by this receiving a retirement bonus (a 'golden handshake') (Coughlan and Schmidt, 1984; Murphy, 1999), which is shown by a large positive residual. Therefore, a large positive residual could be seen as an indication for a high turnover probability, leading to a positive coefficient for the residual when the age of executives increases.

[17] A logit regression model is basically the same as a linear regression model, but measures the relation between a categorical variable and independent variables.
[18] The change of the residual sign from negative to positive is assumed to be from the age 65, since that is the mandatory retirement age.

The logit regression formula used in order to test hypothesis 4 is as follows:

$$Ln\left(\frac{P_{turnover}}{1-P_{turnover}}\right) = \alpha + \beta_1 * RES_t + \beta_2 * Age_t + \beta_3 * CAR_t + \varepsilon_t \quad (5)$$

Hereby, $P_{turnover}$ states for the turnover probability, while RES_t stands for the residual in the fiscal year t from formula 2. Age_t stands for the executive age in the fiscal year t and CAR_t stands for the cumulative abnormal returns for the fiscal year t.

In the table below an overview of the expected signs of the independent variables are given.

Expected sign of the variables			
	Residual	Age	CAR
Age < 63	-	+	-
Age 63 - 65	-	+	-
Age > 65	+	+	-

Table 4.1: Expected sign of the variables.

4.3 Summary

First of all hypothesis 1 will be tested using formula 2. Hereby the relation between the CAR and $Ln\ total\ compensation$ will be tested. Adding on to this, the second hypothesis is tested to find evidence for the influence of stock options on the effect of CAR on total compensation. Hereby the stock options variable is used as a dummy variable and is being interacted with the CAR variable. Following from this, hypothesis 3 will be tested to provide evidence for the relation between revenues and $Ln\ total\ compensation$. Then, all three hypotheses are tested again when controlling for turnover. The goal hereby is to provide answer on the question whether turnover influences the effect of the independent variables CAR, dummy stock options on the effect of CAR and the revenues on the dependent variable $Ln\ TC$.

Finally, hypothesis 4 focuses on testing the effect of turnover on total compensation. To do so, a logit regression is conducted, whereby turnover is the dependent dichotomous variable. The *Residual*, *Age* and CAR are the independent variables. The results are then compared with the expected results.

5 Results

In this chapter the results of the hypotheses discussed in the beginning of this thesis will be discussed. These hypotheses will be discussed by comparing them not only with the reference paper of Coughlan and Schmidt (1984), but also with similar studies conducted so far. By discussing these hypotheses, an answer will be given for the research question:

Research question: *What is the effect of turnover on executive compensation?*

Section 5.1 focusses on hypothesis 1, in which the results regarding the relation between $Ln\ total\ compensation$ and CAR will be discussed. Section 5.2 focusses on hypothesis 2, in which the focus will be on the effect of stock options on the relation between CAR and $Ln\ total\ compensation$. Section 5.3 focuses on hypothesis 3, in which the relation between revenues and $Ln\ total\ compensation$ is discussed. Section 5.4 focuses on testing these three hypotheses after removing the turnover effect. Section 5.5 focuses on discussing hypothesis 4. Finally, in section 5.6 a summary will be given of the findings.

To discuss these hypotheses, the following tables are used: 5.1 (Appendix), 5.2 and 5.3 (Appendix). In these tables results of regression testing hypotheses 1, 2, 3 and 4 are presented.

Hereby for every hypothesis discussed the results for all the four groups will be discussed. These groups are: *young group*, *old group* and *CEO group*. Hereby the first three groups are discussed in table 5.1A-B, while the latter group will be discussed using table 5.1C.

5.1 Hypothesis 1

In this section the focus will be on the regression on hypothesis 1. This hypothesis states that there is a positive relation between the $Ln\ total\ compensation$ and CAR. The null hypothesis hereby is:

Null hypothesis 1: *There is a positive relationship between total compensation and abnormal stock return*.

Table 5.1 is divided into three parts. In the first part, table 5.1A, regression results for the *younger group* (age ≤ 63) are presented. In the second part, table 5.1B, regression results for the *older group* (age ≥ 64) are presented.

As can be seen from table 5.1A, the coefficients of CAR for the *young group* are all positive in all the hypothesis 1 regressions. The t-statistic values of all the regressions show that the coefficients are also significant, since the t-statistic values are higher than the critical value of 1.96. From this then can be concluded that the coefficients have a significant influence on $Ln\ total\ compensation$.

According to Coughlan and Schmidt (1984) and Murphy (1999), the total compensation executives receive can be seen as an income compensation to attract, keep and motivate CEOs for the risk taken within the firm. The reason for this has to do with the agency theory (Murphy, 1999; Conyon, 2006), which is explained in the second chapter.

Focusing on the older group in table 5.1B, it can be seen that all the coefficients of CAR are positive, indicating that an increase in the abnormal stock returns will lead to a certain percentage increase in $Ln\ total\ compensation$. The explanation given by Coughlan and Schmidt (1984) is that this is due to retirement-related events. This retirement effect is further elaborated on by Kalyta (2009).He found evidence for a positive relation between CEO pay and firm performance in the pre-retirement period (2 á 3years prior to retirement) when compensation is based on firm performance. Furthermore, he showed that the relation between firm performance and CEO pay is weaker. Looking at the coefficients of Table 5.1B, it can be seen that these coefficients are significantly lower compared to the coefficients of the *younger group*. The reason for the lower coefficients according to Kalyta (2009) is that the market reacts negatively on a CEO retirement announcement. The reason for this negative reaction is due to the fact that a retirement announcement leads to an "end" of the asymmetry between shareholders and CEO regarding the timing of the CEO retirement. By this announcement, any discretional increase in accruals during the retirement period is revealed, leading to an increase in the firm's equity during this period.

The t-statistic values show that all the coefficients are significant, except for the year 2009. However, since the t-value (1.94) has a robust trend towards the critical value of 1.96, it can be stated that even for the year 2009 the coefficient has a certain influence on $Ln\ total\ compensation$. This can also be concluded from the *p-value*. As can be seen, unlike the other *p-values*, the value for 2009 is not 0.0000, but 0.0507, which means that it is higher than the 5% significance level. Initially, from this can be concluded that for the year 2009 hypothesis 1 will not be rejected. However, as also the case is for the t-statistic, the *p-value* of 0.0507 is close to the significance level of 5% and therefore has a strong tendency towards significance. Therefore, it can be stated that, looking at the *p-value*, the coefficient still has a certain influence on $Ln\ total\ compensation$. Finally, the *R-squares* for the *old group* are also remarkably lower. Hereby the same explanation holds as given above for the *young group*.

Comparing the results of the *young* and *old group,* it can be seen that the coefficient of the *young group* is larger compared to the *old group*. These results are consistent with the results provided by Coughlan and Schmidt (1984) and Serfling (2013), who provided evidence for a negative relation between age and firm stock performance. According to Serfling (2013), the older the CEO gets, the

less risk he takes, leading to a lower stock return and therefore a lower CEO compensation. As stated earlier in chapter 2, the reasons provided by Serfling (2013) might also apply here, indicating that the higher the age of executives, the more risk averse they get. However, the younger Contrary, younger CEO tend to take more risk in order to prove their managerial abilities. Serfling (2013) showed that risk-adjusted portfolios of younger CEOs outperformed those of older CEOs, showing that the risk taken by younger CEOs will pay off in the long term, leading to an increase in firm performance and by this CEO compensation. The results for the *younger group* are consistent with the results of Serfling (2013), showing that executives are more acceptable towards risk taking relative to older executives.

5.2 Hypothesis 2

In this section results for hypothesis 2 will be discussed for the *young* group and *old group.* As stated earlier, hypothesis two focused on the influence of stock options on the relation between the abnormal stock returns

Null hypothesis 2: *Adding stock options as an interaction term with abnormal stock returns will not have a positive influence on the effect of abnormal stock return on total compensation*.

First of all, looking at the results for hypothesis 2 results of all the three groups, it can be seen that the interaction term for the *young* and *old* is positive and consistent, exceeding the critical value of 1.96. Also the *p-values* confirm this result for all the groups. From this can be concluded that the null hypothesis 2 can be rejected, indicating that the stock options have significant positive influence on the effect of CAR on total compensation.

This means that providing stock options increases the abnormal returns, indicating an increase in firm value and therefore increasing the pay for executives, confirming the expectations made in chapter 3. These results are also found by Kedia and Mozumdar (2002) and Murphy (1999) who provide evidence for the fact that stock options are given as incentives to increase firm value. However, they do not found evidence for a large influence of stock options on an increase in abnormal returns (Frye, 1999). Contrary, Murphy (1999) found significantly large influence of stock options on stock returns. He showed that stock options led to an increase of 27 to 36% of the stock returns, leading to an almost similar increase in compensation. However, this amount of increase by incorporating stock options cannot be seen from table 5.1. From the table can be derived that this amount is approximately around 4 á 5%. This is also confirmed by Murphy (1999), who compared European and U.S.A firms and concluded that including stock options by European firms only leads to an increase of stock return and executive compensation by less than 5%.

Besides the fact that stock options have significant influence on CAR for all the groups, some differences can be noticed. First of all, comparing the *young* and the *old group*, it can be seen that the coefficient of the stock options for the *young group* is higher than for the *old group*. As stated Earlier, younger executives are more ambitious and therefore more willing to take risk in order to give their career a boost, unlike the older executives (Serfling, 2013). As stated by Serfling (2013), risk taken by younger CEOs leads to an increase in firm value on the long-term. To incentivize this *young group*, firms offer them more stock options as incentives to not only perform better, but also as a way to keep them within the firm (Serfling, 2013; Kedia and Mozumdar, 2002), which can be seen as a trust the firm shows in the young executive, and therefore motivates them more. This is also shown by Ryan and Wiggins III (2001), who found a negative relation between stock options and executive age. However, besides the fact that their theory regarding stock options is in line with the theory found by Serfling (2013), they find that younger CEOs focus on the short-term, since they want to achieve success as fast as possible due to their career-making goals.

5.3 Hypothesis 3

In this section hypothesis 3 will be discussed. This third hypothesis is as follows:

Null hypothesis 3: *Adding revenues as an independent variable to the regression used in hypothesis 1 will have no effect on the significance of the abnormal stock return coefficient*.

Focusing on the both age groups, it can be seen that for both the coefficient is positive and significant. From this can be concluded that null hypothesis 3 can be rejected, indicating that adding revenues as an independent variable to the regression in hypothesis 1 has a significant positive effect on the executive compensation. Also from the *p-values* this can be concluded.

However, the *older group* has a higher coefficient compared to the coefficient of the *younger group*. Ryan and Wiggins III (2001) gave two reasons for this. First of all, they found a positive relation between age, and by this working experience, and revenues. Furthermore, they stated that, the older the CEOs, the closer they get to their retirement age. Therefore, to gain more compensation, they are more likely to increase revenues. This is also confirmed by Hwang and Kim (2009).

5.4 Turnover effect

In this section the fourth group will be discussed. As mentioned in chapter 3, it is important to find out whether turnover affects the results from the compensation regressions discussed above. As stated in chapter 3, all the observations are pooled together and only the board members and CEOs are separated. The sample consists of 646 board members and 38 CEOs. The results are shown below in table 5.2.

As can be seen from the table below, the coefficient of CAR, interaction term and revenues is positive and significant for all the three hypotheses and for both groups: *board members* and *CEOs*. Comparing the results between *board members* and *CEOs*, it can be seen that the coefficients of *CEOs* are higher for all the variables compared to those of *board members*. From this can be concluded that *CEOs*' compensation plan is more dependent on the CAR, the interaction term and the revenues, since *CEOs* are responsible for the firm's performance and therefore they bear all the most risk (Murphy, 1999).

Furthermore, looking at the board members, it can be seen that especially the coefficients for CAR and stock options are the most significant, while the coefficient of the revenues is balancing on the edge of being significant (t-statistic is slightly above the critical value of 1.96). This can be explained by the fact that the pay structure of the *board members* mostly is for more than 40% defined by the share performance and the stocks, since *board members* are not restricted anymore to participate in the long-term value creation of the company.[19]

Another interesting finding is that controlling for turnover does have influence on CAR, stock options and revenues for especially the CEOs, since their value is higher than the general executive values shown in table 5.1. From this can be concluded that with the absence of turnover the relation between CAR, stock options and revenues on the one hand and total compensation on the other hand is stronger than when the turnover effect is included into the sample. These results are consistent with the finding of Coughlan and Schmidt (1984).

Concluding from this table is that, first of all, hypotheses 1, 2 and 3 are rejected, indicating that CAR, the interaction term and revenues have a significant influence on total compensation. Secondly, it can be concluded controlling for turnover leads to higher coefficients for CEOs compared to the pooled executive samples in table 5.1, indicating that turnover has a negative influence on the total compensation by influencing these three independent variable.

[19] www.clariant.com

Absence of turnover						
	Hypothesis 1		*Hypothesis 2*		*Hypothesis 3*	
	Pooled Sample (6)		Stock options (7)		Revenues (8)	
	Board	CEO	Board	CEO	Board	CEO
CAR for year t	0.0911 (2.71)[1]	0.1671 (3.91)	0.1221 (2.99)	0.1699 (2.67)	0.0944 (2.82)	0.1577 (2.95)
Interaction* term year t	-	-	0.0498 (2.58)	0.0313 (2.84)	-	-
Deflated revenues growth in year t	-	-	-	-	0.0657 (1.97)	0.2636 (2.44)
Sample size	759	142	759	142	759	142
Number of firms	38	48	38	48	38	48
R-square	0.039	0.044	0.049	0.058	0.054	0.055
P-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

[1] T-statistic

* The interaction term shows whether excess returns have a higher impact on executive compensation for executives who have stock options.

Table 5.2: Absence of turnover.

5.5 Hypothesis 4

As found in the end of the previous section, turnover has a negative influence on the effect of the three variables on the total compensation, with regards to CEOs especially. However, to confirm whether this is the case, a logit regression will be conducted, as also stated in chapter 4. Hereby hypothesis 4 is tested by using a logit regression (formula 5).[20] The results are shown in table 5.3. The results are discussed by comparing the expected coefficient (signs) from table 4.1 with table 5.3. Hereby the independent variables are discussed separately.

Focusing on the residual variable, the expectations were that the higher the age, the more the sign of the residual will change from negative to positive. This is, as also stated in chapter 3, due to the fact that the older the executive becomes, the more weight is put on other factors rather than the CAR,

[20] See section 4.2 for more information regarding the logit regression.

leading to a change in the compensation structure (Coughlan and Schmidt, 1984; Murphy, 1999). As can be derived from table 5.3, it can be seen that the results confirm the expectations from table 4.1. The residual is negatively when the executive is younger than 63 years, indicating that less emphasis is put on other factors than CAR when defining the executive's compensation plan, and ends to be positive when the executive is eventually older than 65 years. This confirms the fact that the older executives become, the higher the probability of retirement, and by this turnover. This influences the compensation structure, where other factors, such as retirement bonuses, are taken into account (Coughlan and Schmidt, 1984; Murphy, 1999). Furthermore, the change of the sign from negative to positive is somewhere between the age 63 – 65, since in this category the value of the coefficient is closest to null. From this can be concluded that more emphasis is put on other factors in the period prior to reaching the mandatory retirement age of 65 years (Coughlan and Schmidt, 1984).

The age coefficients for all the three groups are positive, indicating that the higher the age, the larger the probability of turnover occurrence. Even though these results are consistent with the expectations in table 4.1, namely that the sign of the coefficients is positive, it can be seen that this sign is not large. From these results it can be concluded that age does not have significant influence on turnover. This is also confirmed by the given t-statistics, which do not exceed the critical value of 1.96, indicating that age does not have a significant influence on turnover. However, these results confirm the findings made by Healy, Lehman and McDaniel (1995), who found evidence for the fact that age has no significant influence on turnover, since results showed that the effect of age on turnover is close to null.

Finally, the coefficients for CAR confirm the expectations from table 4.1, showing a negative sign for all the three age categories. This confirms the fact that an increase in the performance of stock returns, and therefore an increase in the CAR, will increase the trust in the executive, which then decreases the probability of turnover. These findings are similar to those of Coughlan and Schmidt (1984). These results are also significant, showing t-statistic values above the critical value of 1.96. Furthermore, these findings are also consistent with those of Jenter and Kanaan (2015), who showed that executives are more likely to be fired (higher probability of turnover) after a bad firm performance (bad stock performance/low CAR). Adding on to this, they found that dismissing executives, and more particularly the CEOs, is for a large part based on the firm performance and for a very small amount on the comparison with the peer group. Furthermore, they found that a bad firm performance has a higher increase in the probability of turnover, compared to the level of decrease in turnover probability when the firm performs well. This evidence shows the existence of

loss aversion among firms.[21] Using this evidence of Jenter and Kanaan (2015) on the results of CAR coefficients, it can be seen that executives younger than 63 years have a lower negative coefficient compared to the group of executives older than 65 years. This means that an increase in CAR for the youngest group will lead to a lower decrease in the turnover probability compared to that of the oldest group. From this can be concluded that loss aversion within firms is higher the younger the age of the executive. This can be explained by the findings provided by Serfling (2013), who showed that younger CEOs take relatively more risk compared to their older equivalent.[22]

5.6 Summary

Results for hypothesis 1 have provided evidence for a significant relationship between total compensation and abnormal stock returns for executives of companies listed on the Dutch AEX or German DAX Stock Index. Despite small differences in coefficients between the different groups, these results are consistent with previous research conducted.

Similar results can be provided for hypothesis 2, showing a significant evidence for the fact that including stock options influences the effect of the cumulative abnormal returns (CAR) on the compensation.

Hypothesis 3 provides evidence for the significant influence of revenues on total compensation. Hereby it is interesting to see that women are more awarded for an increase in revenues compared to men, due to the fact that they show a relatively less risky behavior.

Adding on to this, after removing the turnover effect, results show that turnover has a negative influence on total compensation, since it decreases the coefficients of the independent variables CAR, interaction term (CAR*dummy stock options) and revenues.

Hypothesis 4 is tested to find out whether an negative relation consists between turnover and total compensation. Hereby the probability of turnover as an dependent variable is tested among the independent variables *Residual*, *Age* and CAR. The results of the coefficients for the *Residual* and CAR have confirmed the expectations, showing a change in sign from negative to positive for the *Residual* variable and a negative sign for the CAR variable. The coefficients of the *Age* variable were positive as expected, but not significant, because their values were close to null.

[21] Loss aversion means that avoiding losses is more preferred than accepting profits. This topic is out of the scope of this thesis and therefore will therefore not be discussed.
[22] Hereby not taking into account whether taking more risk leads to better firm performance.

6 Conclusion and Discussion

6.1 Conclusion

Many studies have been conducted on executive compensation and factors that influence this compensation. Most of these studies focused on executive compensation of U.S. firms and found a significant relationship between executive compensation and firm performance, whereby firm performance is measured by the stock returns or revenues. Besides of this, also the turnover effect has been tested, focusing on the relation between turnover and firm performance.

This thesis focus mainly on the effect of turnover on the relationship between executive compensation and firm performance for firms listed on the Dutch AEX Stock Exchange and the German DAX Stock Exchange. The focus on these two stock exchanges is due to the fact that most complete data regarding executives is only available for these two stock exchanges. The results are found using regression analysis to test four different hypotheses. Hereby the data of all the executives is manually collected for the period 2008-2012, since for this period the most of the complete data is available.

Results in this thesis show that turnover has a significant influence on the relationship between executive compensation and firm performance, since turnover effects the coefficient level of the variables used in the regression analysis that determine the executive compensation. This is found by testing four hypotheses. In the first hypothesis, the focus was on the relation between the stock returns and executive compensation. Results from the regression analysis showed a significant influence of stock returns on regression for the two different age groups. For the *young group* the coefficients are found to be larger than for the *old group*. As Serfling (2013) showed, this can be explained by the fact that young executives tend to take more risk, since they a more risky behavior compared to older executives.

Hypothesis 2 focused on the effect of stock options on the relation between stock returns and executive compensation. Hereby stock options are used as a dummy variable. Results showed a significant positive influence of stock options on the effect of stock returns on executive compensation. For the *young group* the effect of stock options is higher than that of the *old group*, which can be explained by the same reason given before, namely that young executives tend to take more list and therefore are incentivized for this.

Hypothesis 3 focused on the relation between revenues and executive compensation. Hereby the results for the age group are significant. Hereby results show a higher coefficient for older

executives, which is explained by the fact that the higher their age, the higher their experience, which also in general positively influences the revenues.

These three hypotheses are rested again after controlling for turnover. Hereby, all executives that retired within the period 2008-2012 were removed from the sample. The results showed that, after removing turnover, the general coefficients were higher, indicating that these variables have a higher positive influence on executive compensation when turnover is absent. From this can be concluded that turnover has a negative influence on the relation between executive compensation and firm performance.

To test this even further, a logit regression is used, whereby turnover is the dependent dichotomous variable. Hereby the *Residual*, *Age* and CAR are used as the independent variables. Results for the *Residual* confirm the expectations made in chapter 4, whereby it is expected that the sign of the *Residual* will change from negative to positive as *Age* increases. This shows that the higher the executive becomes, the higher the probability of retirement and therefore the higher the probability of turnover. Focusing on the *Age* variable by itself, results show that the coefficients are not large. From this can be concluded that *Age* does not have a significant influence on turnover, which is also confirmed by the fact that the t-statistics are below the critical value of 1.96. Finally, focusing on the CAR, results show a confirmation of the expectations made in chapter 4, showing a positive sign. This means that the higher the CAR, the higher the performance of the firm is and therefore leads to an increase in trust in the executive's performance. This therefore decreases the probability of turnover.

6.2 Discussion

Even though data used in this thesis helped to provide an answer to the research question, still some limitations existed in order to have a more extended research. First of all, there was not sufficient enough data for other European firms to have a more general idea of the relation between executive compensation and firm performance in Europe. Therefore, data used in this thesis, which consisted of executive data of firms listed on the AEX or DAX, cannot be fully representative for Europe as a whole. Adding more data of other European firms will extend this research and provide more insights on this relationship for whole Europe.

Secondly, a lack of data also occurred in the compensation structure. Currently, only public data is available regarding the amount of base salary and bonus received by executives. Also is shown whether executives have stock options included, but not the amount of stock options. Therefore, it is recommended to collect more specific data regarding the compensation structure in order to provide

more representative and robust results regarding the relation between executive compensation and firm performance.

A solution for this might be to extend the data with more firms. This can be by including other European firms into the sample. However, since mentioned earlier, there is not enough complete data regarding this, another option is also possible, namely including firms from other Dutch or German Stock Exchanges. For the Dutch market this would be the AMX and AsCX. For the German market this could be the MDAX and SDAX. This data can also then be used in order to find differences in this relation between the different stock exchanges.

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Appendix

Market Model (MM): calculating CAR

This model is a statistical model and has the following formula:

$$R_{i,t} = E\left[R_{i;t}|X_t\right] + \xi_{i,t}, \text{ whereby} \quad \text{(A)}$$

$$E\left[R_{i;t}|X_t\right] = \alpha_i + \beta_i * R_{m,t}, \text{ and} \quad \text{(B)}$$

$$E\left[\xi_{i,t}\right] = 0 \text{ and } VAR\left[\xi_{i,t}\right] = \sigma^2_{\xi_i}$$

Hereby $R_{i,t}$[23] stands for the daily return of stock i at time t. This is being calculated by taking the average expected return of the stock $E\left[R_{i;t}|X_t\right]$. This expected return is the return that is being forecasted by investors and analysts. Investors and analysts make their forecasts based on information at time (X_t). Furthermore, $\xi_{i,t}$ is the abnormal return of company i at time t. $R_{m,t}$ is the market portfolio return at time t and α_i and β_i are the MM parameters (Shamoun Poulus, 2014). To measure the abnormal returns, formula **(3)** must be rewritten: Hereby we get the following formula:

$$AR_{i,t} = R_{i,t} - E\left[R_{i;t}|X_t\right] = \xi_i \quad \text{(C)}$$

Then, adding formula **(4)** into formula **(5)** gives us the following formula:

$$\xi_i = R_{i,t} - \alpha_i + \beta_i * R_{m,t} = AR_{i,t} \quad \text{(D)}$$

[23] The MSCI Index is used as a proxy for the market return.

After having found the daily abnormal return of stock i, the *CAR* can be calculated by taking the sum of the daily abnormal returns. Hereby the following formula is used:

$$CAR^{i}_{t;t+k} = \Sigma_k AR_{i;t+k} = \Sigma_k \xi_{i;t+k} \quad \text{(E)}$$

Table 5.1: Coefficient estimates for the hypotheses 1, 2 and 3.								
Table 5.1A: Age ≤ 63								
	Hypothesis 1						*Hypothesis 2*	*Hypothesis 3*
	t = 2008 (1)	t = 2009 (2)	t = 2010 (3)	t = 2011 (4)	t = 2012 (5)	Pooled Sample (6)	Stock options (7)	Revenues (8)
Constant	0.0011	0.0132	0.0080	0.0151	0.0147	0.0128	0.0138	0.0106
	(1.21)	(1.47)	(0.83)	(1.13)	(1.52)	(1.33)	(1.27)	(1.04)
CAR for year t	0.1364	0.1582	0.1632	0.1592	0.1603	0.1573	0.1502	0.1549
	(3.77)	(2.87)	(2.43)	(3.87)	(3.03)	(4.92)	(3.29)	(4.87)
Interaction* term year t	-	-	-	-	-	-	0.0404	-
							(2.56)	
Deflated revenues growth in year t	-	-	-	-	-	-	-	0.1264
								(6.77)
Sample size	169	171	166	153	155	814	814	814
Number of firms	27	27	30	30	29	55	55	55
R-square	0.067	0.057	0.073	0.065	0.048	0.067	0.058	0.066
P-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Table 5.1B: Age ≥ 64								
	Hypothesis 1						*Hypothesis 2*	*Hypothesis 3*
	t = 2008	t = 2009	t = 2010	t = 2011	t = 2012	Pooled Sample (6)	Stock options (7)	Revenues (8)

	(1)	(2)	(3)	(4)	(5)			
Constant	0.0270 (0.89)	0.0354 (1.13)	0.0187 (0.67)	0.0203 (1.07)	0.0479 (1.35)	0.0233 (0.72)	0.0251 (0.86)	0.0287 (1.14)
CAR for year t	0.0265 (2.84)	0.0237 (1.94)	0.0153 (2.37)	0.0439 (3.14)	0.1369 (2.85)	0.0727 (2.73)	0.0773 (3.02)	0.1021 (2.12)
Interaction* term year t	-	-	-	-	-	-	0.0298 (2.16)	-
Deflated revenues growth in year t	-	-	-	-	-	-	-	0.2571 (2.27)
Sample size	17	15	19	18	18	87	87	87
Number of firms	10	4	5	6	10	55	55	55
R-square	0.034	0.021	0.027	0.055	0.046	0.055	0.053	0.058
P-value	0.0000	0.0507	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
* Interaction term: product of the revenues for time t and dummy stock options.								

Table 5.3: Turnover effect							
	Constant	Residual	Age	CAR	Model	N	Number. of turnover cases
Age < 63							
Coefficient	-2.34	-1.52	0.50	-1.14		845	199
t-statistic	8.93	6.61	1.87	7.89	18.66		
Probability Coefficient(s) = 0*	0.0022	0.0163	0.1955	0.0043	0.0117		
Age 63 - 65							
Coefficient	7.63	.44	0.15	-1.38		40	21
t-statistic	12.47	4.77	1.90	2.91	19.11		
Probability Coefficient(s) = 0	0.0014	0.0233	0.3472	0.2951	0.0154		
Age > 65							
Coefficient	6.33	1.28	0.42	-1.56		16	2
t-statistic	8.55	5.16	1.85	5.53	16.81		
Probability Coefficient(s) = 0	0.0127	0.0381	0.5163	0.0481	0.0287		
* This shows the probability that the coefficient of the variables *Residual*, *Age* or *CAR* is null.							