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# ABNORMAL CEO COMPENSATION AND FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM EUROPE

Bachelor's Thesis
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**Abstract of bachelor's thesis**

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This study presents new evidence on a relationship between chief executive officer compensation and subsequent firm performance. The sample is collected from Europe, consists of 1459 firm years and covers period of 2000-2013. Methods used to test the relationship in this study are ordinary least squares and weighted least squares regression models. Previous studies of Carter et al. (2016) and Core et al. (1999) suggest that abnormal CEO compensation has a decreasing effect on subsequent firm performance. Contrary to the previous findings, results of this study suggest that the relationship is rather positive, albeit abnormal compensation coefficients are not thoroughly found statistically significant. The results might be explained with global differences in CEO compensation practices, policies and regulations.

**Keywords** CEO Compensation, Abnormal pay, Ordinary least squares, Weighted Least Squares, Say-on-Pay, Pay-performance.

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# 1. Introduction

A compensation package of a firm's chief executive officer (CEO) is in most cases only a tiny fraction of the firm's total expenses and, thus, does not have a significant effect on the firm's performance ratios on its own. However, compensation has a vital role in motivating and encouraging CEO to grow and improve the firm one is working for. Therefore, it is worth studying for whether a link between the CEO compensation and firm performance exists.

Previous studies in the field have shown that such relation can be found (see e.g. Carter et al., 2016; Core et al., 1999; Ozkan, 2011; Cai & Walkling, 2011; Larcker et al., 2011). Ozkan (2011), Cai and Walkling (2011), and Larcker et al. (2011) documented existing relationship between the CEO compensation and shareholder return. Ozkan (2011) focused on pay-performance elasticity between total CEO compensation and total shareholder return and found that these have a positive correlation with each other. Cai and Walkling (2011) and Larcker et al (2011) studied shareholder return and Say-on-Pay regulation[1]. Both found that the regulation has a value-enhancing effect on firms which executives earned abnormally high compensations. In addition, Carter et al (2016) and Core et al (1999) found a significant and negative coefficient between the abnormal CEO compensation and firm performance measured in accounting based ratios.

However, the previous researches have examined this pay-performance relation almost solely with US, UK or Japanese data while Europe as whole has been left disregarded. Kaplan (1997) discovered great differences in corporate governance practices among Japan, Germany and the US. He found that the CEO turnover rates and changes in CEO's compensation are substantially uneven in different countries in various business-related events. In addition, Bruce et al. (2005) investigated the variation in CEO compensation habits between the UK and Germany and reported distinct differences. Due to reported diversity in CEO compensation policies and rationales behind them, the findings from previous studies cannot be applied globally.

The main objective of this thesis is to test whether the link between abnormal chief executive compensation and subsequent firm performance exists in Europe. Replicating previous studies by Carter et al (2016), Cai and Walkling (2011) and Core et al. (2008), I start with building a model to estimate an expected CEO compensation which I use to calculate abnormal CEO compensation for each observation. Next, I conduct ordinary least squares and weighted least squares regression models explaining firm performance with the abnormal compensation to discover possible link between these measures.

[1] *The Say-on-Pay regulation* refers to shareholders' right to vote on CEO's and other executive's compensation packages (see e.g. Thomas & Van der Elst, 2015)

The thesis is structured in a following way: In Section 2, I present thoroughly existing studies in the field and their main findings. In addition, I present the hypotheses. Further in Section 3, I suggest models to test the hypotheses with and describe the data. Empirical results and robustness tests are presented and discussed in Section 4. Finally, conclusions and suggestions for further research are reviewed in Section 5.

# 2. Literature Review and Hypotheses

## 2.1. Variation in Governance and Compensation Practices Globally

Kaplan (1997) compares governance practices and systems between Germany, Japan and the US. He finds that level of executive compensation is low in Japan, moderate in Germany and high in the US. Ownership of the firms is diffused in the US, concentrated in Germany and less concentrated in Japan. Moreover, capital and takeover markets are relatively illiquid and minor, somewhat liquid and minor, and very liquid and major in Germany, Japan and the US, respectively. A role of banking differs among the countries as well.

In addition to these background characteristics of the governance systems, Kaplan (1997) reports diversity in likelihoods of CEO turnover and change in CEO compensation in various scenarios. According to the paper, likelihoods of negative and positive actions on the CEO compensation seem to be less sensitive to negative or positive business events in Japan and Germany compared to the US. Kaplan (1997) suggests that this is because of larger equity positions US executives hold compared to their German or Japanese colleagues: Poor or strong firm performance has more direct effect on executive's own wealth in the US.

Bruce et al. (2005) study these governance systems as well. In their statistical studies, Towers Perrin reports significant differences in a ratio between CEO compensation and average earnings of employees. Their results indicate that this ratio is over 500 in the US, approximately 25 in the UK and a little over 10 in France, Italy and Spain. (as cited in Bruce et al., 2005). Bruce et al. (2005) focus more closely on comparing the UK and Germany to the US, and despite the similarities in politics, demographic and economic factors, they report great differences in compensation practices between the UK and Germany and, in addition, between these two and the US.

Furthermore, Thomas and Van der Elst (2015) examine Say-on-Pay regulations globally and point out numerous significant differences among the countries reviewed. First, shareholders' influencing power in countries with two-tier boards are, in general, weaker when compared to ones with one-tier board structure. Second, the means of influencing vary remarkably across the countries. For example, Thomas and Van der Elst (2015) point out that in the US shareholders are entitled to set an individual pay package of directors whereas in the UK shareholders are only allowed to vote on proposed remuneration package. Third, in some countries shareholders are entitled to influence in each executive's compensation separately while in other countries shareholders vote on a general level of compensation for all executives. Finally, time span of influencing varies significantly. For example, in the US it may take up to three years until shareholders can cast their vote. In the Netherlands it might take even longer.

As previous studies have shown, the variation in factors that affect executives' compensation level is remarkable. The factors originate from both inside and outside the firm and basis of these factors differ from governance policies and habits to regulation and legislation. As findings of Kaplan (1998) imply, influencing power of these factors seems to be high

## 2.2. Prior CEO Compensation Studies

The determinants behind the CEO compensation have been widely covered in research. There is robust evidence that, for instance, the firm's level of cash holdings (Liu, 2011), the institutional ownership (Hartzell & Starks, 2003; Ozkan, 2011), the firm size (Sun et al., 2013; Carter et al., 2016) and the board size (Jensen, 1993; Ozkan, 2011) have all an effect on the level of the CEO total compensation[2]. Such determinants, which are not under CEO's direct decision and influence the CEO's total compensation, are in the literature generally referred as variables of expected CEO compensation (see e.g. Cai & Walkling, 2011; Core et al., 2008; Larcker et al., 2011).

Carter et al. (2016) and Core et al. (1999) study the link between the firm performance and the excess compensation[3] which is the difference between the total compensation and the expected compensation model they built. Furthermore, both papers conduct ordinary least squares (OLS) regression explaining the subsequent firm performance with the excess compensation and multiple control variables. Both Carter et al. (2016) and Core et al. (1999) present statistically significant results suggesting that excess CEO compensation is followed by decrease in the firm's subsequent performance. Both studies use data collected entirely from the US.

Ozkan (2011) and Kato and Kubo (2006) focus on investigating the pay-performance elasticity with UK and Japanese data, respectively. Ozkan (2011) suggests there is a link between the CEO compensation and the firm stock return: increase in the shareholder return leads to higher CEO compensation growth in the US compared to the UK. According to Kato and Kubo (2006), similar link is found from Japan as well.

[2] In existing literature (see e.g. Carter et al. (2016)) the CEO total compensation consists of salary, bonus, equity pay and other compensation. I use this formula in this study as well.

[3] Following an example by Carter et al. (2016), I use a term *abnormal compensation* in this study.

Their results suggest that the link is nevertheless weaker in Japan than in the US. Comparison with continental Europe is not done in either of the studies.

Cai and Walkling (2011) and Larcker et al. (2011) investigate the Say-on-Pay regulations' effect on stock returns. Both studies suggest that such regulation proposals lead to significantly positive abnormal returns in firms with abnormally high CEO compensation and, vice versa, negative returns in firms with abnormally low CEO compensation. The findings imply that the market recognizes the relationship between the CEO compensation and performance. In addition, both Cai and Walkling (2011) and Larcker et al. (2011) suggest that the market considers these two factors to be negatively related. Both studies use Say-on-Pay proposals and firm data from the US.

In conclusion, prior studies have focused on either US, Japanese or UK companies and their findings suggest that the link between CEO compensation and firm performance does exist. However, I think that the prior findings, made with US, Japanese or UK compensation and firm data, cannot be applied to whole Europe without further analysis. This is because of the variation in corporate governance systems, executive compensation practices, legislation and regulation, one of which might conflict the previous findings. Thus, the aim of thesis is to empirically test whether abnormal CEO compensation has an influence on firm's subsequent performance using European CEO and firm data.

### 2.3. Hypotheses

When a CEO's observed total compensation differs from expected compensation, which is based on firm characteristics and governance related variables defined more precisely in Section 3.2, the CEO earns abnormal compensation. The purpose of this study is to test whether this abnormal compensation can be statistically tied to firm performance in following year. Thus, I state the null hypothesis as follows:

**$H_0$: Abnormal CEO compensation is not linked to subsequent firm performance.**

If I can associate the abnormal CEO compensation to subsequent firm performance with statistical significance, an object of interest is whether this association is positive or negative. If the link found is positive, abnormal compensation may be an indicator of CEO's superior talent (Hayes & Schaefer, 2000). This talent may be a rationale for beyond expected compensation and, thus, excess compensation might be an adequate decision businesswise. Therefore, I state the first alternative hypothesis as follows:

**$H_{1A}$: Abnormal CEO compensation is linked to subsequent firm performance. Abnormal compensation can be associated with improved firm performance.**

Alternatively, abnormal compensation may be in a relationship with subsequent firm performance, but estimates decreasing performance instead. In such case, abnormality of compensation may be a sign of agency problems between board of directors and CEO and it has an observable effect on firm performance (Core et al., 1999). The second alternative hypothesis is as follows:

**$H_{1B}$: Abnormal CEO compensation is linked to subsequent firm performance. Abnormal compensation can be associated with decreased firm performance.**

# 3. Research Design

## 3.1. Data

To test the hypotheses, I use a sample of CEO compensation and board data retrieved from BoardEx database. Corresponding firm performance and characteristics data is retrieved from Thomson Reuters Datastream database. The complete sample (Sample A) starts from year 2000 and ends in 2013. The sample consists of 1459 firm years of 364 unique firms from 22 European countries. Currencies of all observations are exchanged to euro with a year-end exchange rate[4].

In addition to the complete sample, I use three alternative samples. First additional sample (Sample B) consists of firms which reporting currency is euro. With this exclusion my goal is to eliminate an impact of currency rates to domestic import and export which may cause distortions to firm performance measures when comparing firms with different currency rates. This sample comprises 850 firm years.

In a second additional sample (Sample C) I eliminate financial sector. This is done because of differences in accounting figures between financial and nonfinancial firms. For instance, Fama and French (1992) emphasize the difference in interpretation of high leverage between financial and nonfinancial firms. High leverage is common quality in financial sector and not an indication of financial distress whereas in nonfinancial sector high leverage could mean troubled financial health (Fama & French, 1992). This sample is composed of 1234 observations.

The last sample (Sample D) is a combination of the previous two. The sample includes only euro quoted firms operating in nonfinancial sector. Due to eliminations, the sample size is 705 firm years. Firms in each

[4] Foreign exchange rates used are presented in Appendix 1.

sample are distributed in 12 industry groups classified by Fama and French[5]. The distribution of industries in samples are presented in Table 1.

**Table 1**

**Industry Distribution**

This table presents percentage distribution of industries in each sample. The industry classification is based on Standard Industrial Classification (SIC) codes. In this study, the SIC codes are assigned to firms by highest contributing business segment to net sales or revenues. The assignation is retrieved from Thomson Reuters Worldscope via Datastream. SIC codes held in each industry are presented in Appendix B.

| | Percentage of Firms in Sample (%) | | | |
|---|---|---|---|---|
| | Sample A (N=1459) | Sample B (N=850) | Sample C (N=1234) | Sample D (N=705) |
| 1. Consumer Non-Durables | 10.60 | 11.05 | 12.55 | 13.33 |
| 2. Consumer Durables | 3.28 | 5.64 | 3.89 | 6.81 |
| 3. Manufacturing | 12.45 | 9.87 | 14.74 | 11.91 |
| 4. Energy | 4.92 | 1.76 | 5.83 | 2.13 |
| 5. Chemicals and Allied Products | 3.83 | 4.35 | 4.53 | 5.25 |
| 6. Computers & Business Equipment | 9.78 | 10.46 | 11.50 | 12.77 |
| 7. Telephone and Television Transmission | 5.27 | 5.99 | 6.23 | 7.23 |
| 8. Utilities | 2.19 | 2.35 | 2.59 | 2.84 |
| 9. Wholesale, Retail, Laundries, Repair Shops | 6.98 | 7.52 | 8.26 | 9.08 |
| 10. Healthcare, Medical Equipment, and Drugs | 8.00 | 6.82 | 9.47 | 8.23 |
| 11. Finance | 15.39 | 17.27 | 0.00 | 0.00 |
| 12. Other | 17.31 | 16.92 | 20.40 | 20.43 |

## 3.2. Regression Models

Following example of existing executive compensation studies (see e.g. Carter et al, 2016; Core et al, 2008), I present abnormal compensation as residual from expected compensation for each observation:

$$AbComp_{it} = \log(TotComp)_{it} - \mathbf{E}(\log(TotComp))_{it}, \tag{1}$$

where $AbComp_{it}$ is abnormal compensation computed as residuals from the expected total compensation regression model for individual *i* in year *t* (presented in equation (2)), $\log(TotComp)_{it}$ is natural logarithm

[5] The Fama & French classification details are presented in Appendix 2. Data retrieved from: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_12_ind_port.html, date 13-Nov-2017.

scaled sum of total direct compensation and total equity linked compensation of individual *i* in year *t,* and $\mathbf{E}(\log(TotComp))_{it}$ is natural logarithm scaled total compensation computed with estimated coefficients of equation (2) for individual *i* in year *t* representing expected value of total compensation.

BoardEx defines total direct compensation as a sum of salary, bonus, other compensation and employers defined retirement/pension contribution for the period. Further, total equity linked compensation equals sum of shares awarded, estimated value of options awarded and LTIPs (Long term incentive plan) awarded in the period[6]. The observed total compensation is a sum of the total direct compensation and the total equity linked compensation.

I compute the expected total compensation with an ordinary least squares (OLS) regression model that is constructed on CEO's personal background and holdings, board structure, firm's size, firm's investment opportunities, and year and industry fixed effects. CEO and board related data is retrieved from BoardEx and firm related from Datastream. The expected total compensation regression model is as follows:

$$\begin{aligned}\log(TotComp)_{it} = {} & \\ & \beta_0 + \beta_1 \log(Wealth)_{it} + \beta_2 Tenure_{it} + \beta_3 Dur_{it} + \beta_4 Dirs_{it} + \beta_5 AlsoChair_{it} \\ & + \beta_6 \log(MV)_{it} + \beta_7 BM_{it} + \beta_8 Lev_{it} + \sum_{j=1}^{11} \beta_{8+j} Ind_j + \sum_{j=1}^{12} \beta_{19+j} Year_j + \varepsilon_{it},\end{aligned} \tag{2}$$

where $\log(TotComp)_{it}$ is observed total compensation of individual *i* in year *t*, $\beta_0$ is the intercept, $\log(Wealth)_{it}$ is the natural logarithm scaled total value of firm *i* securities CEO owns based on closing stock price of the annual report date in year *t*[7], $Tenure_{it}$ is the number of years individual *i* has been the chief executive officer in year *t*, $Dur_{it}$ is individual *i*'s duration of employment in the company in year *t*, $Dirs_{it}$ is the number of directors in board *i* in year *t*, $AlsoChair_{it}$ is a dummy variable indicating whether individual *i* is also chairman of firm's board in year *t*, $\log(MV)_{it}$ is firm *i*'s natural logarithm scaled market value at year *t* end, $BM_{it}$ is book to market ratio of firm *i* at year *t* end, $Lev_{it}$ is firm *i*'s leverage calculated as total debt divided with total capital in year *t*, $Ind_j$ is a dummy variable of industry *j,* $Year_j$ is a dummy variable for year *j*, and $\varepsilon_{it}$ is the error term of individual *i* in year *t*[8].

I use coefficients from OLS regression equation (2) to compute the expected compensation $\mathbf{E}(\log(TotComp))_{it}$. The abnormal compensation $AbComp_{it}$ is then computed as residuals from the

[6] Definitions of CEO and Board data retrieved from http://metalib.ie.edu/ayuda/Varios/BoardExWRDSDataDictionary.pdf, date 14-Nov-2017.

[7] If BoardEx reports CEO's total wealth as zero, I re-set the total wealth value equal to 1 to have logarithm scaled value of zero.

[8] Definitions of corresponding firm variables are retrieved from http://www-cgi.uni-regensburg.de/Fakultaeten/WiWi/roeder/DownloadsGeneral/Datastream%20Worldscope.pdf, date 14-Nov-2017.

expected compensation model as presented in equation (1). The abnormal compensation is used in main regressions and robustness tests as presented in following section.

To study the relationship between abnormal compensation and firm's subsequent performance, I use ordinary least squares (OLS) and weighted least squares (WLS) regression models. To explain the variation in a dependent performance variable, return on assets ($ROA_{it+1}$), I use $Abnormal\ Compensation_{it}$ and multiple control variables as explanatory variables. In both main regression models and models to test results' robustness, I measure dependent variable in period *t*+1 and explanatory variables in period *t*. Variable *StockReturn* is an exception as it is measured in period *t*-1. Thus, I present my main regressions as follows:

$$\begin{aligned} ROA_{it+1} = & \\ & \beta_0 + \beta_1\, AbComp_{it} + \beta_2 \log(MV)_{it} + \beta_3 \log(Assets)_{it} + \beta_4 Lev_{it} + \beta_5 CHS_{it} \\ & + \beta_6 \log(Sales)_{it} + \beta_7 StockReturn_{it-1} + \sum_{j=1}^{11} \beta_{7+j} Ind_j + \sum_{j=1}^{12} \beta_{18+j} Year_j + \varepsilon_{it+1}, \end{aligned} \quad (3)$$

where $ROA_{it+1}$ is return on average of year *t*'s and year *t*+1's total assets, $\beta_0$ is the intercept, $AbComp_{it}$ is the abnormal compensation of individual *i* in year *t* computed with equation (1) which is winsorized at 1% and 99% level, $\log(MV)_{it}$ is firm *i*'s natural logarithm scaled market value at year *t* end, $\log(Assets)_{it}$ is firm *i*'s natural logarithm scaled total assets in year *t*, $Lev_{it}$ is firm *i*'s leverage calculated as total debt divided with total capital in year *t*, $CHS_{it}$ is number of closely held shares divided by common shares outstanding in firm *i* in year *t*, $\log(Sales)_{it}$ is firm *i*'s natural logarithm scaled gross sales and other operating revenue less discounts, returns and allowances in year *t*, $StockReturn_{it-1}$ is total return of firm *i*'s common stock in year *t; $Ind_j$* is a dummy variable of industry *j*, $Year_j$ is a dummy variable for year *j*, and $\varepsilon_{it+1}$ is the error term of individual *i* in year *t*+1.

According to the Gauss-Markov theorem, ordinary least squares coefficients are the best linear unbiased estimators if following assumptions hold: (1) the errors have zero mean, (2) the variance of the errors is constant and finite, (3) the errors are independent, and (4) the errors are unrelated to explanatory variables. It is fair to assume that when CEO's compensation or firm's size and performance are higher, variance of these measures increases as well. Thus, due to natural presence of heteroscedasticity (i.e. the variance of regression errors is not constant) in this type of study, I also conduct weighted least squares (WLS) regressions which are identical to ordinary least squares models, but observations are unequally weighted. WLS can used as an estimation procedure when the errors $\varepsilon$ are uncorrelated, but variances of the errors are not unequal (Montgomery, Peck, & Vining, 2012).

To determine weights for the WLS regressions, I regress absolute values of residuals from the original OLS regression against fitted values of the original OLS regression as follows:

$$|R_{3,i}| = F_{3,i} + \varepsilon_i, \tag{4}$$

where $R_{3,i}$ is the residual of observation $i$ from the OLS regression conducted with the equation (3), $F_{3,i}$ is the fitted value of observation $i$ from the OLS regression conducted with the equation (3), and $\varepsilon_i$ is the error term of observation $i$.

The fitted values from the equation (4) represent estimates of standard deviations of the errors. Finally, the weights used in the WLS regressions are computed as follows:

$$W_i = \frac{1}{{F_{4,i}}^2}, \tag{5}$$

where $W_i$is the the weight of observation $i$ used in the WLS regression and $F_{4,i}$ is the fitted value of observation $i$ from OLS regression conducted with equation (4).

WLS regressions should yield results with constant error term variance. To test robustness of my results, I also conduct the OLS and WLS regressions with $ROE_{t+1}$ and $EBIT_{t+1}/totalAssets_{t+1}$ performance ratios as dependent variables. Results of robustness tests are presented in Section 4.2.

### 3.3. Descriptive Statistics

Table 2 presents summary of descriptive statistics of variables I use in this study. The CEO background and firm governance variables *Tenure*, *Dur,* and *AlsoChair* are slightly right-skewed with higher means than medians and 75th percentiles further from medians than 25th percentiles. I find this expected because, intuitively, successful chief executive officers tend to hold their title while, as Kaplan (1997) suggests, CEOs with deficient performance are likely to be replaced rather quickly. Total wealth (log(*Wealth*)) appears to be symmetrically distributed around its mean and median. In addition, *Dirs* and *CHS* seems approximately symmetrical likewise, but standard deviation of closely held shares percentages is relatively high. However, I do not find this surprising since ownership structure of firms is not limited in any way.

Distributions of firm size related variables log(*MV),* log(*Assets),* and log(*Sales)* are symmetrical around their median and values of mean and median are almost equal. Standard deviation of book to market (*BM*) and leverage (*Lev*) ratios are, expectedly, high. Sample firms operate on different industries of which average ratio of leverage and growth prospects differ naturally. Even after excluding financial sector, standard deviation remains remarkably high (see Panel C in Appendix C).

Performance variables *StockReturn, ROA,* and *ROE* appear to be symmetrically balanced around their means and medians, but variable *EBIT* is highly right-skewed with substantial deviation. Even after controlling for currency quotation and excluding financial sector (See Panels B-D in Appendix C), skewness remains. This firm size skewness is adjusted in *Sales*, *Assets*, and *MV* variables with logarithmic scaling. However, this can not be done with *EBIT* since number of firms in data have negative value of *EBIT*. This might influence results of robustness tests conducted with variable *EBIT*.

Table 3 presents pairwise correlations of variables used in this paper. As expected, number of directors on board (variable *Dirs*) correlates noteworthily (correlation over 0.500) with logarithm scaled values of *Sales*¸ *Assets,* and *MV*. The market value variable *MV* correlates significantly (correlation over 0.800) with values of *Sales* and *Assets* and noteworthily with variable *EBIT*. In addition, variable log(*Assets*)'s correlations with *EBIT* and log(*Sales*) are over 0.500. From perspective of this study, most interestingly any correlation between abnormal CEO compensation variable *AbComp* and other variables is not found: All pairwise correlations equal less than 0.040.

## Table 2

## Descriptive Statistics

This table presents descriptive statistics of complete data (Sample A) used. Sample period is 2000-2013 and observations are firm years. Data is retrieved from BoardEx and Datastream databases. Listed variables are the ones used in equations (1-3) and variables used in tests for robustness. Descriptive statistics for all samples are presented in Appendix C.

| | N | Mean | Standard Deviation | $25^{th}$ percentile | Median | $75^{th}$ percentile |
|---|---|---|---|---|---|---|
| $\log(Wealth)_t$ | 1459 | 7.939 | 2.340 | 6.916 | 8.284 | 9.469 |
| $Tenure_t$ (years) | 1459 | 4.615 | 4.386 | 1.700 | 3.500 | 6.100 |
| $Dur_t$ (years) | 1459 | 11.370 | 9.592 | 3.900 | 8.000 | 16.900 |
| $Dirs_t$ | 1459 | 12.490 | 4.483 | 9.250 | 12.000 | 15.000 |
| $AlsoChair_t$ | 1459 | 0.397 | 0.490 | 0.000 | 0.000 | 1.000 |
| $\log(MV)_t$ | 1459 | 8.227 | 2.118 | 6.745 | 8.519 | 9.853 |
| $BM_t$ | 1459 | 1.094 | 6.907 | 0.317 | 0.496 | 0.768 |
| $Lev_t$ (%) | 1459 | 38.030 | 23.216 | 22.960 | 37.420 | 50.370 |
| $AbComp_t$ | 1459 | 0.232 | 0.322 | 0.010 | 0.010 | 0.396 |
| $\log(Assets)_t$ | 1459 | 15.670 | 2.375 | 14.055 | 15.979 | 17.213 |
| $CHS_t$ (%) | 1459 | 25.320 | 24.225 | 1.445 | 19.215 | 41.825 |
| $\log(Sales)_t$ | 1459 | 15.079 | 2.343 | 13.599 | 15.593 | 16.716 |
| $StockReturn_{t-1}$ (%) | 1459 | 1.157 | 0.753 | 0.847 | 1.099 | 1.319 |
| $ROA_{t+1}$ (%) | 1459 | 5.172 | 12.674 | 1.633 | 5.200 | 8.818 |
| $ROE_{t+1}$ (%) | 1459 | 12.371 | 47.944 | 5.325 | 12.930 | 20.610 |
| $EBIT_{t+1}$ (€ mn) | 1459 | 2185.194 | 4793.817 | 53.780 | 476.600 | 2208.000 |

$\log(Wealth)_t$ = natural logarithm scaled total value of firm securities CEO owns cased on closing stock price of the annual report date in year *t*; $Tenure_t$ = number of years individual has been CEO in year *t*; $Dur_t$ = individual's duration of employment in the firm in year *t*; $Dirs_t$ = number of directors in board in year *t*; $AlsoChair_t$ = dummy variable indicating whether CEO is also chairman of the board (1 = yes, 0 = no) in year *t*; $\log(MV)_t$ = natural logarithm scaled total market value of the firm at year *t* end; $BM_t$ = book to market ratio of the firm at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; $\log(Assets)_t$ = logarithm scaled market value at year *t* end; $CHS_t$ = percentage of closely held shares in year *t*; $\log(Sales)_t$ = logarithm scaled gross sales in year *t*; $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $ROA_{t+1}$ = return on average of year *t*'s and year *t*+1's total assets; $ROE_{t+1}$ = return on average of year *t*'s and year *t*+1's equity in year *t+1*; and $EBIT_{t+1}$ = earnings of a firm before interest expense and income taxes in year *t*+1.

**Table 3**

**Correlation Matrix**

This table presents pairwise correlations of variables used in this thesis. The correlations are calculated with complete data set (Sample A).

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $(Wealth)_t$ | 1.000 | | | | | | | | | | | | | | |
| $ure_t$ | 0.104 | 1.000 | | | | | | | | | | | | | |
| $t$ | 0.132 | 0.474 | 1.000 | | | | | | | | | | | | |
| $s_t$ | 0.022 | -0.051 | 0.154 | 1.000 | | | | | | | | | | | |
| $oChair_t$ | -0.112 | 0.066 | 0.115 | 0.097 | 1.000 | | | | | | | | | | |
| $(MV)_t$ | 0.392 | -0.041 | 0.167 | 0.546 | -0.007 | 1.000 | | | | | | | | | |
| $t$ | 0.012 | -0.031 | 0.038 | 0.012 | -0.059 | -0.004 | 1.000 | | | | | | | | |
| $t$ | 0.082 | 0.043 | 0.065 | 0.274 | -0.028 | 0.235 | 0.104 | 1.000 | | | | | | | |
| $omp_t$ | -0.038 | 0.031 | 0.003 | -0.029 | -0.026 | -0.068 | -0.014 | -0.002 | 1.000 | | | | | | |
| $g(Assets)_t$ | 0.296 | -0.039 | 0.159 | 0.630 | -0.041 | 0.866 | 0.051 | 0.452 | -0.062 | 1.000 | | | | | |
| $IS_t$ | -0.272 | 0.077 | -0.064 | -0.150 | 0.076 | -0.338 | -0.064 | -0.156 | 0.063 | -0.314 | 1.000 | | | | |
| $g(Sales)_t$ | 0.272 | -0.015 | 0.205 | 0.578 | 0.009 | 0.833 | -0.009 | 0.334 | -0.058 | 0.893 | -0.335 | 1.000 | | | |
| $ockReturn_{t-1}$ | 0.034 | 0.003 | -0.029 | -0.047 | 0.008 | -0.015 | -0.008 | -0.007 | 0.030 | -0.049 | -0.031 | -0.073 | 1.000 | | |
| $OA_{t+1}$ | 0.135 | 0.036 | 0.052 | 0.013 | 0.040 | 0.219 | -0.035 | -0.121 | 0.009 | 0.088 | 0.003 | 0.204 | 0.073 | 1.000 | |
| $OE_{t+1}$ | 0.113 | 0.017 | 0.034 | 0.052 | 0.013 | 0.202 | -0.006 | -0.023 | -0.002 | 0.129 | -0.042 | 0.199 | 0.055 | 0.827 | 1.000 |
| $BIT_{t+1}$ | 0.251 | -0.064 | 0.020 | 0.272 | -0.164 | 0.523 | -0.009 | 0.131 | -0.042 | 0.534 | -0.228 | 0.494 | -0.002 | 0.069 | 0.079 |

*lth*)$_t$ = natural logarithm scaled total value of firm securities CEO owns cased on closing stock price of the annual report date in year *t*; *Tenure* $_t$ = number al has been CEO in year *t*; *Dur* $_t$ = individual's duration of employment in the firm in year *t*; *Dirs* $_t$ = number of directors in board in year *t; AlsoChair* $_t$ = indicating whether CEO is also chairman of the board (1 = yes, 0 = no) in year *t*; log(*MV)* $_t$ = natural logarithm scaled total market value of the firm at ye book to market ratio of the firm at year *t* end; *Lev* $_t$ = leverage calculated as total debt divided with total capital in year *t*; *AbComp* $_t$ = abnormal comp ed with equation (1) in year *t*, winsorized at 1% and 99% level; log(*Assets)* $_t$ = logarithm scaled market value at year *t* end; *CHS* $_t$ = percentage of clos n year *t*; log(*Sales)* $_t$ = logarithm scaled gross sales in year *t; StockReturn* $_{t-1}$ = total return of firm's common stock in year *t*-1; *ROA* $_{t+1}$ = return on average year *t*+1's total assets; *ROE* $_{t+1}$ = return on average of year *t*'s and year *t*+1's equity in year *t+1;* and *EBIT* $_{t+1}$ = earnings of a firm before interest expe taxes in year *t*+1.

# 4. Results and Discussion

## 4.1. Main Regressions

Summary of results from the main OLS regression is presented in Table 4. All regressions are estimated with control dummy variables *Year* and *Ind*, of which coefficients are omitted from the summary table because they are not in a scope of this study. All reported control variables are statistically significant at least at 5 percent level. As expected, the results imply that preliminary level of market value, sales and stock returns all have positive effect on firm performance in subsequent year. Concentration of shares to directly affiliated or majority stakeholders appears to have a slightly boosting effect on performance as well. In addition, subsequent return on assets appears to decrease if a firm holds substantial number of total assets or leverage.

The abnormal CEO compensation variable *AbComp* is positive in all samples, but not statistically significant within 10 percent confidence level. The p-values of *t*-statistics of *AbComp* estimates are 35.95%, 40.22%, 18.10%, and 13.06% for Sample A, B, C, and D, respectively.

A positive coefficient of *AbComp* suggests that abnormal CEO compensation is associated with increased subsequent firm performance. This is contrary to findings of previous studies by Carter et al. (2016) and Core et al. (1999). Both Carter et al. (2016) and Core et al. (1999) found negative association between abnormal CEO compensation and firm performance with ordinary least squares regressions and US data. Although statistically insignificant, the results of positive coefficients throughout all samples contrast with previous findings with US data.

**Table 4**

**Main OLS Regression Summary**

This table presents ordinary least squares regression results from equation (3). Dependent variable is $ROA_{t+1}$. Descriptive statistics of the dependent variable and the explanatory variables are presented in Appendix C. Estimates of dummy variables *Industry* and *Year* are omitted from the summary because they are not in a scope of this study. Estimated coefficients are reported without parentheses and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

| | Sample A | Sample B | Sample C | Sample D |
|---|---|---|---|---|
| $Intercept$ | -0.863 | 6.080 | 0.521 | 3.826 |
| | (-0.152) | (1.022) | (0.084) | (0.354) |
| $AbComp_t$ | 0.873 | 0.706 | 1.395 | 2.406 |
| | (0.917) | (0.838) | (1.339) | (1.514) |
| $\log(MV)_t$ | 3.024 | 2.791 | 3.376 | 2.825 |
| | (8.178)*** | (8.459)*** | (7.858)*** | (4.524)*** |
| $\log(Assets)_t$ | -5.341 | -5.693 | -7.057 | -7.061 |
| | (-10.300)*** | (-12.977)*** | (-11.319)*** | (-8.033)*** |
| $Lev_t$ | -0.045 | -0.038 | -0.059 | -0.104 |
| | (-2.692)*** | (-2.496)** | (-3.072)*** | (-3.325)*** |
| $CHS_t$ | 0.044 | 0.028 | 0.042 | 0.045 |
| | (3.133)*** | (2.500)** | (2.627)*** | (2.062)** |
| $\log(Sales)t$ | 4.004 | 4.127 | 5.396 | 5.591 |
| | (10.013)*** | (12.221)*** | (11.969)*** | (8.864)*** |
| $StockReturn_{t-1}$ | 1.506 | 1.347 | 3.258 | 4.591 |
| | (3.383)** | (4.054)*** | (4.307)*** | (4.065)*** |
| N | 1459 | 850 | 1234 | 705 |
| *R Squared* | 0.186 | 0.313 | 0.225 | 0.214 |
| *F-Statistic* | 10.560 | 12.000 | 11.610 | 6.100 |

$AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; $\log(MV)_t$ = natural logarithm scaled total market value of the firm at year *t* end; $\log(Assets)_t$ = logarithm scaled market value at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $CHS_t$ = percentage of closely held shares in year *t*; $\log(Sales)_t$ = logarithm scaled gross sales in year *t*; $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $ROA_{t+1}$ = return on average of year *t*'s and year *t*+1's total assets.

Table 5 presents the summary of the main WLS regression results. I found variance of the OLS regression error terms to be heteroscedastic as expected whereas the WLS regressions errors were homoscedastic[9]. The weights for regressions are computed with equations (4) and (5) using results from the OLS regressions

[9] I tested the existence of heteroscedasticity with the Breush-Pagan test presented by Breusch and Pagan (1979).

presented in Table 4. All control variables are statistically significant at least at 5 percent level, except variable *CHS* in Sample B. In Samples B and C, the abnormal compensation variable *AbComp* is positive with statistical significance at 5 percent level. Signs of all variables (except *Intercept*) in the OLS regressions equal signs in the WLS regressions.

Contrary to findings of Carter et al. (2016) and Core et al. (1999), the weighted least squares regression results are positive and in Samples B and C statistically significant. The results indicate that abnormal CEO compensation is not related to decreased firm performance, but rather vice versa. Based on the results solely, abnormal CEO compensation appears to have an increasing effect on subsequent return on assets and abnormal compensation might therefore be explainable by superior CEO talent. More detailed discussion of the results is presented in Section 4.3.

**Table 5**

**Main WLS Regression Summary**

This table presents weighted least squares regression results from equation (3). The weights are calculated with equations (4) and (5). Dependent variable is $ROA_{t+1}$. Descriptive statistics of the dependent variable and the explanatory variables are presented in Appendix C. Estimates of dummy variables *Industry* and *Year* are omitted from the summary because they are not in a scope of this study. Estimated coefficients are reported without parentheses and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

| | Sample A | Sample B | Sample C | Sample D |
|---|---|---|---|---|
| $Intercept$ | 9.787 | 25.340 | 2.636 | 5.905 |
| | (0.208) | (4.353)*** | (0.234) | (0.516) |
| $AbComp_t$ | 0.079 | 1.543 | 3.818 | 2.596 |
| | (0.064) | (2.228)** | (2.213)** | (1.556) |
| $\log(MV)_t$ | 3.753 | 4.004 | 3.772 | 2.871 |
| | (6.878)*** | (12.331)*** | (4.682)*** | (4.310)*** |
| $\log(Assets)_t$ | -5.854 | -5.668 | -8.247 | -7.275 |
| | (-7.556)*** | (-13.464)*** | (-6.886)*** | (-7.691)*** |
| $Lev_t$ | -0.053 | -0.027 | -0.128 | -0.111 |
| | (-2.220)** | (-1.829)* | (-3.674)*** | (-3.354)*** |
| $CHS_t$ | 0.042 | 0.010 | 0.068 | 0.046 |
| | (2.269)** | (0.991) | (2.568)** | (2.009)** |
| $\log(Sales)t$ | 3.425 | 2.249 | 5.925 | 5.666 |
| | (5.210)*** | (5.966)*** | (5.960)*** | (8.106)*** |
| $StockReturn_{t-1}$ | 1.131 | 0.730 | 6.978 | 4.584 |
| | (6.349)*** | (9.357)*** | (5.762)*** | (3.972)*** |

*Table 5 continues in the next page*

| *Table 5 continued from the previous page* | | | | |
|---|---|---|---|---|
| | Sample A | Sample B | Sample C | Sample D |
| *N* | 1459 | 850 | 1234 | 705 |
| *R Squared* | 0.127 | 0.443 | 0.167 | 0.199 |
| *F-Statistic* | 6.686 | 21.020 | 8.025 | 5.591 |

*AbComp* $_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; log(*MV)* $_t$ = natural logarithm scaled total market value of the firm at year *t* end; log(*Assets)* $_t$ = logarithm scaled market value at year *t* end; *Lev* $_t$ = leverage calculated as total debt divided with total capital in year *t*; *CHS* $_t$ = percentage of closely held shares in year *t*; log(*Sales)* $_t$ = logarithm scaled gross sales in year *t; StockReturn* $_{t-1}$ = total return of firm's common stock in year *t*-1; *ROA* $_{t+1}$ = return on average of year *t*'s and year *t*+1's total assets.

## 4.2. Robustness Tests

To test the results presented in Section 4.1., I conduct the OLS and the WLS regressions with different performance measures as dependent variables. The performance measures used in the robustness tests are $ROE_{t+1}$ and $EBIT_{t+1}/totalAssets_{t+1}$.

Robustness Test 1 is conducted with $ROE_{t+1}$ as dependent variable. Table 6 and Table 7 report summaries for the OLS and the WLS regression results, respectively. The OLS regression results are almost equal to the Main OLS regression results. All variables' signs and values are almost equal to ones presented in main OLS regression summary (Table 4). In the results conducted with dependent variable $ROE_{t+1}$, control variables *Lev* and *CHS* lose their statistical significance in Samples A and C. Some significance losses are seen in other Samples as well. In addition, goodness of fit (indicated by R Squared) decreases in Robustness Test 1 in all samples.

Comparison of the WLS results of Robustness Test 1 (Table 7) and of the Main Regression (Table 5) yields partially similar interpretations. Variables *AbComp,* log(*MV*), log(*Assets*), log(*Sales*), and *StockReturn* have same sign, but significance is lost in some samples. The *AbComp* coefficient is statistically significant only in the regression performed with Sample B. Variables *Lev* and *CHS* have opposite signs in different samples. Differences in *CHS* cannot be explained with firms in samples, but it seems logical that leverage coefficient is different in Samples A and B (financial sector included) and Samples B and C (financial sector excluded). However, similar bifurcation is not seen in the WLS results conducted with *ROA* as dependent variable (Table 5).

**Table 6**

**Robustness Test 1: OLS Regression Summary**

This table presents ordinary least squares regression results from equation (3). Dependent variable is $ROE_{t+1}$. Descriptive statistics of the dependent variable and the explanatory variables are presented in Appendix C. Estimates of dummy variables *Industry* and *Year* are omitted from the summary because they are not in a scope of this study. Estimated coefficients are reported without parentheses and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

| | Sample A | Sample B | Sample C | Sample D |
|---|---|---|---|---|
| $Intercept$ | -22.801 | -11.875 | -17.843 | -8.357 |
| | (-1.018) | (-0.555) | (-0.693) | (-0.191) |
| $AbComp_t$ | 2.367 | 1.506 | 3.347 | 7.572 |
| | (0.631) | (0.498) | (0.776) | (1.178) |
| $\log(MV)_t$ | 8.268 | 7.651 | 9.912 | 8.819 |
| | (5.668)*** | (6.451)*** | (5.577)*** | (3.493)*** |
| $\log(Assets)_t$ | -14.641 | -14.960 | -19.854 | -21.269 |
| | (-7.159)*** | (-9.485)*** | (-7.699)*** | (-5.985)*** |
| $Lev_t$ | -0.051 | -0.096 | -0.081 | -0.357 |
| | (-0.764) | (-1.741)* | (-1.016) | (-2.829)*** |
| $CHS_t$ | 0.049 | 0.076 | 0.047 | 0.165 |
| | (0.878) | (1.862)* | (0.725) | (1.876)* |
| $\log(Sales)t$ | 11.570 | 12.463 | 15.382 | 17.795 |
| | (7.335)*** | (10.266)*** | (8.249)*** | (6.978)*** |
| $StockReturn_{t-1}$ | 3.985 | 3.632 | 9.084 | 15.367 |
| | (2.269)** | (3.042)*** | (2.903)*** | (3.427)*** |
| N | 1459 | 850 | 1234 | 705 |
| *R Squared* | 0.114 | 0.235 | 0.136 | 0.151 |
| *F-Statistic* | 5.938 | 8.115 | 6.314 | 3.997 |

$AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; $\log(MV)_t$ = natural logarithm scaled total market value of the firm at year *t* end; $\log(Assets)_t$ = logarithm scaled market value at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $CHS_t$ = percentage of closely held shares in year *t*; $\log(Sales)_t$ = logarithm scaled gross sales in year *t*; $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $ROE_{t+1}$ = return on average of year *t*'s and year *t*+1's equity in year *t+1*.

**Table 7**

**Robustness Test 1: WLS Regression Summary**

This table presents weighted least squares regression results from equation (3). The weights are calculated with equations (4) and (5). Dependent variable is $ROE_{t+1}$. Descriptive statistics of the dependent variable and the explanatory variables are presented in Appendix C. Estimates of dummy variables *Industry* and *Year* are omitted from the summary because they are not in a scope of this study. Estimated coefficients are reported without parentheses and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

| | Sample A | Sample B | Sample C | Sample D |
|---|---|---|---|---|
| $Intercept$ | 14.196 | 99.817 | 3.252 | -2.060 |
| | (0.459) | (3.570)*** | (0.084) | (-0.043) |
| $AbComp_t$ | 0.675 | 4.606 | 7.965 | 9.032 |
| | (0.142) | (2.251)** | (1.337) | (1.280) |
| $\log(MV)_t$ | 10.373 | 13.133 | 11.928 | 8.793 |
| | (4.934)*** | (11.297)*** | (4.376)*** | (3.098)*** |
| $\log(Assets)_t$ | -19.796 | -13.363 | -27.669 | -22.160 |
| | (-6.512)*** | (-8.237)*** | (-6.683)*** | (-5.480)*** |
| $Lev_t$ | 0.107 | 0.337 | -0.044 | -0.396 |
| | (1.169) | (6.566)*** | (-0.374) | (-2.803)*** |
| $CHS_t$ | 0.059 | -0.007 | 0.109 | 0.175 |
| | (0.808) | (-0.192) | (1.193) | (1.808)* |
| $\log(Sales)t$ | 12.911 | 0.337 | 19.736 | 18.314 |
| | (4.994)*** | (0.249) | (5.861)*** | (6.065)*** |
| $StockReturn_{t-1}$ | 2.437 | 6.513 | 18.188 | 16.816 |
| | (3.751)*** | (4.884)*** | (4.258)*** | (3.462)*** |
| N | 1459 | 850 | 1234 | 705 |
| R Squared | 0.067 | 0.938 | 0.095 | 0.136 |
| F-Statistic | 3.316 | 400.800 | 4.214 | 3.521 |

$AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; $\log(MV)_t$ = natural logarithm scaled total market value of the firm at year *t* end; $\log(Assets)_t$ = logarithm scaled market value at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $CHS_t$ = percentage of closely held shares in year *t*; $\log(Sales)_t$ = logarithm scaled gross sales in year *t*; $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $ROE_{t+1}$ = return on average of year *t*'s and year *t*+1's equity in year *t+1*.

The second robustness test is executed with dependent variable $EBIT_{t+1}/totalAssets_{t+1}$ and its OLS results are presented in Tables 8. Control variables of sales (log(*Sales*)), market value (log(*MV*)), total assets (log(*Assets*)), closely held shares (*CHS*), and stock return (*StockReturn*) have same signs as in the Main OLS results (Table 4) and the Robustness Test 1 OLS results (Table 6). The coefficients of these control variables are all statistically significant at least at 5 percent level in all samples. The *AbComp* coefficient is negative in Sample B and positive in others without statistical significance within confidence interval of 90 percent.

**Table 8**

**Robustness Test 2: OLS Regression Summary**

This table presents ordinary least squares regression results from equation (3). Dependent variable is $EBIT_{t+1}$/Assets $_{t+1}$. Descriptive statistics of the dependent variable and the explanatory variables are presented in Appendix C. Estimates of dummy variables *Industry* and *Year* are omitted from the summary because they are not in a scope of this study. Estimated coefficients are reported without parentheses and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

| | Sample A | Sample B | Sample C | Sample D |
|---|---|---|---|---|
| $Intercept$ | 0.046 | -0.065 | 0.065 | 0.118 |
| | (0.927) | (1.670)* | (1.201) | (1.685)* |
| $AbComp_t$ | 0.006 | -0.009 | 0.014 | 0.000 |
| | (0.705) | (-1.015) | (1.502) | (0.021) |
| $\log(MV)_t$ | 0.041 | 0.033 | 0.046 | 0.033 |
| | (12.469)*** | (9.015)*** | (12.264)*** | (8.023)*** |
| $\log(Assets)_t$ | -0.073 | -0.074 | -0.089 | -0.086 |
| | (-15.945)** | (-15.396)*** | (-16.462)*** | (-15.027)*** |
| $Lev_t$ | -0.000 | 0.000 | -0.000 | -0.000 |
| | (-0.253) | (0.101) | (-0.957) | (-1.208) |
| $CHS_t$ | 0.001 | 0.000 | 0.000 | 0.000 |
| | (4.125)*** | (3.591)*** | (3.053)*** | (3.272)*** |
| $\log(Sales)t$ | 0.052 | 0.053 | 0.064 | 0.065 |
| | (14.704)*** | (14.359)*** | (16.354)*** | (15.790)*** |
| $StockReturn_{t-1}$ | 0.011 | 0.008 | 0.023 | 0.019 |
| | (2.836)*** | (2.398)** | (3.460)*** | (2.684)*** |
| N | 1459 | 850 | 1234 | 705 |
| *R Squared* | 0.303 | 0.365 | 0.346 | 0.411 |
| *F-Statistic* | 19.970 | 15.150 | 21.140 | 15.700 |

$AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; log(*MV*) $_t$ = natural logarithm scaled total market value of the firm at year *t* end; log(*Assets*) $_t$ = logarithm scaled market value at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $CHS_t$ = percentage of closely held shares in year *t*; log(*Sales*) $_t$ = logarithm scaled gross sales in year *t;* $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $EBIT_{t+1}$ = earnings of a firm before interest expense and income taxes in year *t*+1.

**Table 9**

**Robustness Test 2: WLS Regression Summary**

This table presents weighted least squares regression results from equation (3). The weights are calculated with equations (4) and (5). Dependent variable is $EBIT_{t+1}$/Assets $_{t+1}$. Descriptive statistics of the dependent variable and the explanatory variables are presented in Appendix C. Estimates of dummy variables *Industry* and *Year* are omitted from the summary because they are not in a scope of this study. Estimated coefficients are reported without parentheses and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

| | Sample A | Sample B | Sample C | Sample D |
|---|---|---|---|---|
| $Intercept$ | 0.250 | 0.229 | 0.352 | 0.327 |
| | (5.579)*** | (3.544)*** | (6.884)*** | (4.530)*** |
| $AbComp_t$ | -0.007 | -0.008 | 0.009 | 0.001 |
| | (-0.104) | (-0.970) | (1.172) | (0.130) |
| $\log(MV)_t$ | 0.052 | 0.037 | 0.062 | 0.042 |
| | (16.104)*** | (9.807)*** | (16.960)*** | (9.981)*** |
| $\log(Assets)_t$ | -0.066 | -0.063 | -0.075 | -0.082 |
| | (-14.425)*** | (-12.820)*** | (-13.953)*** | (-13.183)*** |
| $Lev_t$ | 0.001 | -0.000 | 0.000 | -0.000 |
| | (1.219) | (-0.429) | (1.208) | (-0.898) |
| $CHS_t$ | 0.000 | 0.000 | -0.000 | 0.000 |
| | (0.241) | (2.265)** | (-2.366)** | (1.786)* |
| $\log(Sales)t$ | 0.026 | 0.034 | 0.021 | 0.044 |
| | (6.492)*** | (7.815)*** | (4.540)*** | (8.229)*** |
| $StockReturn_{t-1}$ | 0.006 | 0.005 | 0.017 | 0.004 |
| | (2.037)** | (1.604) | (2.883)*** | (0.680) |
| N | 1459 | 850 | 1234 | 705 |
| *R Squared* | 0.322 | 0.380 | 0.354 | 0.438 |
| *F-Statistic* | 21.860 | 16.200 | 21.960 | 17.520 |

$AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; log(*MV*) $_t$ = natural logarithm scaled total market value of the firm at year *t* end; log(*Assets*) $_t$ = logarithm scaled market value at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $CHS_t$ = percentage of closely held shares in year *t*; log(*Sales*) $_t$ = logarithm scaled gross sales in year *t;* $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $ROA_{t+1}$ = return on average of year *t*'s and year *t*+1's total assets; $ROE_{t+1}$ = return on average of year *t*'s and year *t*+1's equity in year *t+1;* and *EBIT* $_{t+1}$ = earnings of a firm before interest expense and income taxes in year *t*+1.

Table 9 presents the WLS regression results of the Robustness Test 2. Again, control variables log(*MV*), log(*Assets*), log(*Sales*), and *StockReturn* are on same side of zero and statistically significant, as in the Main and the Robustness Test 1 WLS results. Coefficients of variables *Lev* and *CHS* differ in samples and are not statistically significant throughout all samples. The prime variable of interest, *AbComp,* is not positive in all samples nor statistically significant in any of them.

### 4.3. Discussion

The main results and their robustness tests presented in Sections 4.1. and 4.2. do not hold a uniform line throughout the tests. The abnormal CEO compensation variable *AbComp* is positive in all samples in the both the Main and the Robustness Test 1 regressions. The coefficient of *AbComp* is found statistically significant in Samples B and D in the Main WLS regression and in Sample B in the Robustness Test 1 WLS regression. However, the Robustness Test 2's *AbComp* coefficients are not positive throughout the samples nor statistically significant in any of them. Due to this inconsistency in the regression results, I **fail to reject** the null hypothesis stated in Section 2.3. as follows:

**$H_0$: Abnormal CEO compensation is not linked to subsequent firm performance.**

Thus, a statistically significant relationship between the abnormal CEO compensation and subsequent firm performance cannot be confirmed with this test setting. Albeit the failure to reject the null hypothesis, I find the results highly interesting.

Carter et al. (2016) and Core et al. (1999) findings suggest that abnormal CEO compensation is negatively associated with subsequent firm performance. Both studied the topic with US data and used ordinary least squares regressions. Contrary to their findings, my estimated coefficients of abnormal compensation variable *AbComp* are positive 21 times out of 24 regressions ran and statistically significant in three of these positive ones. Unquestionably, the results of this study are in contradiction to the findings of Carter et al. (2016) and Core et al. (1999).

The main difference between previous studies and this study is the data used. To the best of my knowledge, the topic has not been researched before with Europe covering data. Considering the similarities in methods and the differences in data, I assume the controversial results arise from the latter factor. As presented in Sections 1.1. and 1.2., there are plenty of variation in governance and compensation practices between continents which might explain the results.

As findings of Kaplan (1997) suggest, the level of executive compensation is high in the US whereas in Germany executive compensations are in general on moderate level. Kaplan (1997) reports that CEO turnover is higher in Germany when a firm suffers earnings losses while in the US CEOs are more likely to lose their job when a firm's sales decline. As Kaplan's (1997) findings imply, in Germany CEOs are not as tolerated to generate earnings losses many years in a row as they are in the US. Thus exaggerating, CEOs in the US can keep their employment even when earnings decline if sales grow. This might be one of the key factors behind the controversial results of mine, because studies related to the relation between CEO compensation and firm performance measure performance with earnings ratios.

In addition, as cited in Bruce et al. (2005), the average ratio between the CEO compensation and the average earnings of employees is over 500 in the US and only a little over 10 in central Europe. When general level of compensation is lower, I anticipate that the relationship between CEO compensation and firm performance is more easily found. Furthermore, findings of Kaplan (1997) and Ozkan (2011) propose that CEO's compensation is more flexibly in the US than in Europe because of higher proportion of equity-based compensation.  I believe due to this, the residuals in regression models are lower, and thus, statistical significant link between the compensation and the performance can be easier to verify.

Finally, differences in the Say-on-Pay regulations are substantial. For instance, Thomas and Van der Elst (2015) suggest that US shareholders have stronger means to influence executive compensation than UK shareholders do which increases the flexibility of CEO compensation in the US. Suggested lower flexibility in Europe might weaken the pay-performance link because CEO compensation is not as floating as it is in the US. Studies of Cai and Walkling (2011) and Larcker et al. (2011) support the view that shareholders are aware of this link in the US, but to the best of my knowledge, it is unstudied in Europe.

In conclusion, the CEO compensation seems to be higher, more flexible and more controlled by shareholders in the US than in Europe. In addition, CEO's employment is more easily cancelled in Europe when actual profit is decreasing. Because of differences in compensation characteristics, I believe the CEO compensation is in stronger relationship with subsequent firm performance in the US than in Europe. Due to turnover differences, I assume that abnormal CEO compensation is not an indicator of deficient subsequent firm performance in Europe, but rather vice versa. Even though not thoroughly statistically significant, the results of this study support this view. Adapting the findings Hayes and Schaefer (2000), abnormal CEO compensation might be an indicator of superior CEO talent in Europe. However, to verify the positive link between abnormal CEO compensation and firm performance and its interpretations, further research need to be conducted.

# 5. Conclusions

In this thesis, I have analyzed the link between abnormal CEO compensation and subsequent firm performance with European CEO and firm data. I started with estimating abnormal CEO compensation for each observation with an ordinary least squares regression (OLS) model. Next, I used the abnormal CEO compensation parameter in explaining subsequent firm performance. Relationship between the abnormal compensation and firm performance was tested with both ordinary least squares and weighted least squares (WLS) regressions. An original sample consisted of 1459 firm years and covered period of 2000-2013. I conducted the regressions with four different samples of which one was the original sample and other three were eliminated versions of it. With robustness tests included, in total 24 regressions were conducted to test the link between abnormal CEO compensation and subsequent firm performance.

The abnormal CEO compensation coefficient was positive in both OLS and WLS regression results when dependent variable was return on assets (*ROA*) or return on equity (*ROE*). However, statistically significant coefficient was found only three times out of 16 regressions conducted with these two dependent variables. When I measured the subsequent performance with dependent variable earnings before interest and taxes divided by total assets (*EBIT/Assets*), the abnormal CEO compensation coefficient was not positive throughout all samples nor statistically significant in any of them. Negative coefficient was found three times out of eight regressions with *EBIT/Assets* as dependent variable. Due to inconsistency in the results, I decided not to reject null hypothesis stated as "*Abnormal CEO compensation is not linked to subsequent firm performance*".

Despite the failure to reject the null hypothesis, the results raise a series of questions. Previous researches have found a relation between abnormal CEO compensation and firm performance (see e.g. Carter et al., 2016; Core et al., 1999; Ozkan, 2011; Kato & Kubo, 2006). Studies by Carter et al. (2016) and Core et al. (1999) suggest that abnormal CEO compensation is linked to decreased subsequent firm performance and, contrary to these findings, my results suggest that such link does not exist or if it does, the link is rather positive. These previous studies were conducted with US CEO and firm data while my research based on European data. Executive compensation practices, policies and regulations are remarkably different around the globe (see e.g. Kaplan, 1997; Bruce et al., 2005; Thomas & Van der Elst, 2015) which I believe are the key factors behind contrary findings of this study.

However, determinants behind conflicting results need to be reviewed more closely. I suggest future research should focus on studying these differences in the determinants more closely to reliably find causing factors behind the conflicting results. In future, performance should be measured with other ratios and with wider range of econometric methods to obtain comprehensive set of results. In addition, different time periods should be tested separately since this study's sample period of 2000-2013 includes several high volatile market periods (e.g. the financial crisis and the European debt crisis) which may or may not have caused distortions to the sample used in this study.

# References


Breusch, T. S., & Pagan, A. R. (1979). A simple test for heteroscedasticity and random coefficient variation. *Econometrica: Journal of the Econometric Society, 47*(5), 1287-1294.

Bruce, A., Buck, T., & Main, B. G. (2005). Top executive remuneration: A view from Europe. *Journal of Management Studies, 42*(7), 1493-1506.

Cai, J., & Walkling, R. A. (2011). Shareholders' say on pay: Does it create value? *Journal of Financial and Quantitative Analysis, 46*(2), 299-339.

Carter, M. E., Li, L., & Tehranian, H. (2016). Excess pay and deficient performance. *Review of Financial Economics, 30*, 1-10.

Core, J. E., Guay, W., & Larcker, D. F. (2008). The power of the pen and executive compensation. *Journal of Financial Economics, 88*(1), 1-25.

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

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *Journal of Finance, 47*(2), 427-465.

Hartzell, J. C., & Starks, L. T. (2003). Institutional investors and executive compensation. *Journal of Finance, 58*(6), 2351-2374.

Hayes, R. M., & Schaefer, S. (2000). Implicit contracts and the explanatory power of top executive compensation for future performance. *The RAND Journal of Economics, 31*(2), 273-293.

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance, 48*(3), 831-880.

Kaplan, S. N. (1997). Corporate governance and corporate performance: A comparison of Germany, Japan, and the US. *Journal of Applied Corporate Finance, 9*(4), 86-93.

Kato, T., & Kubo, K. (2006). CEO compensation and firm performance in Japan: Evidence from new panel data on individual CEO pay. *Journal of the Japanese and International Economies, 20*(1), 1-19.

Larcker, D. F., Ormazabal, G., & Taylor, D. J. (2011). The market reaction to corporate governance regulation. *Journal of Financial Economics, 101*(2), 431-448.

Liu, Y. (2011). Corporate cash holdings and CEO compensation incentives. *Journal of Financial Economics, 102*(1), 183-198.

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2012). *Introduction to linear regression analysis* (5th ed., Vol. 821). John Wiley & Sons.

Ozkan, N. (2011). CEO compensation and firm performance: An empirical investigation of UK panel data. *European Financial Management, 17*(2), 260-285.

Sun, F., Wei, X., & Huang, X. (2013). CEO compensation and firm performance: Evidence from the US property and liability insurance industry. *Review of Accounting and Finance, 12*(3), 252-267.

Thomas, R. S., & Van der Elst, C. (2015). Say on Pay around the World. *Washington University Law Review, 92*(3), 652-731.

## Appendix A
## Exchange Rates

This table presents the rates used in currency exchange. The values in table denote the amount of foreign currency one euro represents. The forex rates data is retrieved from https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html, date 19-Oct-2017.

| Year | USD | DKK | GBP | SEK | CHF | NOK | AUD |
|---|---|---|---|---|---|---|---|
| 1999 | 1.0046 | 7.4433 | 0.6217 | 8.5625 | 1.6051 | 8.0765 | 1.5422 |
| 2000 | 0.9305 | 7.4631 | 0.6241 | 8.8313 | 1.5232 | 8.2335 | 1.6770 |
| 2001 | 0.8813 | 7.4365 | 0.6085 | 9.3012 | 1.4829 | 7.9515 | 1.7280 |
| 2002 | 1.0487 | 7.4288 | 0.6505 | 9.1528 | 1.4524 | 7.2756 | 1.8556 |
| 2003 | 1.2630 | 7.4450 | 0.7048 | 9.0800 | 1.5579 | 8.4141 | 1.6802 |
| 2004 | 1.3621 | 7.4388 | 0.7051 | 9.0206 | 1.5429 | 8.2365 | 1.7459 |
| 2005 | 1.1797 | 7.4605 | 0.6853 | 9.3885 | 1.5551 | 7.9850 | 1.6109 |
| 2006 | 1.3170 | 7.4560 | 0.6715 | 9.0404 | 1.6069 | 8.2380 | 1.6691 |
| 2007 | 1.4721 | 7.4583 | 0.7334 | 9.4415 | 1.6547 | 7.9580 | 1.6636 |
| 2008 | 1.3917 | 7.4506 | 0.9525 | 10.8700 | 1.4850 | 9.7500 | 1.9944 |
| 2009 | 1.4406 | 7.4418 | 0.8881 | 10.2520 | 1.4836 | 8.3000 | 1.5969 |
| 2010 | 1.3362 | 7.4535 | 0.8608 | 8.9655 | 1.2504 | 7.8000 | 1.3093 |
| 2011 | 1.2939 | 7.4342 | 0.8353 | 8.9120 | 1.2156 | 7.7540 | 1.2696 |
| 2012 | 1.3194 | 7.4610 | 0.8161 | 8.5820 | 1.2072 | 7.3483 | 1.2685 |
| 2013 | 1.3791 | 7.4593 | 0.8337 | 8.8591 | 1.2276 | 8.3630 | 1.5430 |

## Appendix B

## Fama-French industry classification

This table presents the 12-industry classification by Fama and French. The classification is made with Standard Industrial Classification (SIC) codes. In this thesis, the SIC codes are assigned for firms based on contribution of business segments to net sales or revenues. The assignation is retrieved from Thomson Reuters Worldscope via Datastream. Classification data retrieved from http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_12_ind_port.html, date 13-Nov-2017.

| | SIC Codes |
|---|---|
| 1. Consumer Non-Durables | 0100-0999, 2000-2399, 2700-2749, 2770-2799, 3100-3199, 3940-3989 |
| 2. Consumer Durables | 2500-2519, 2590-2599, 3630-3659, 3710-3711, 3714-3714, 3716-3716, 3750-3751, 3792-3792, 3900-3939, 3990-3999 |
| 3. Manufacturing | 2520-2589, 2600-2699, 2750-2769, 3000-3099, 3200-3569, 3580-3629, 3700-3709, 3712-3713, 3715-3715, 3717-3749, 3752-3791, 3793-3799, 3830-3839, 3860-3899 |
| 4. Energy | 1200-1399, 2900-2999 |
| 5. Chemicals and Allied Products | 2800-2829, 2840-2899 |
| 6. Computers & Business Equipment | 3570-3579, 3660-3692, 3694-3699, 3810-3829, 7370-7379 |
| 7. Telephone and Television Transmission | 4800-4899 |
| 8. Utilities | 4900-4949 |
| 9. Wholesale, Retail, Laundries, Repair Shops | 5000-5999, 7200-7299, 7600-7699 |
| 10. Healthcare, Medical Equipment, and Drugs | 2830-2839, 3693-3693, 3840-3859, 8000-8099 |
| 11. Finance | 6000-6999 |
| 12. Other | - |

**Appendix C**

**Descriptive Statistics**

This table presents descriptive statistics of data used (Sample A, Sample B, Sample C, and Sample D). Sample period is 2000-2013 and observations are firm years. Data is retrieved from BoardEx and Datastream databases. Listed variables are the ones used in equations (1-3) and variables used in tests for robustness. Sample A comprises of all firms, Sample B comprises of only euro quoted firms, Sample C comprises of all firms excluding financial sector, and Sample D comprises of only euro quoted non-financial firms.

| | N | Mean | Standard Deviation | 25th percentile | Median | 75th percentile |
|---|---|---|---|---|---|---|
| Panel A: Sample A | | | | | | |
| $\log(Wealth)_t$ | 1459 | 7.939 | 2.340 | 6.916 | 8.284 | 9.469 |
| $Tenure_t$ (years) | 1459 | 4.615 | 4.386 | 1.700 | 3.500 | 6.100 |
| $Dur_t$ (years) | 1459 | 11.370 | 9.592 | 3.900 | 8.000 | 16.900 |
| $Dirs_t$ | 1459 | 12.490 | 4.483 | 9.250 | 12.000 | 15.000 |
| $AlsoChair_t$ | 1459 | 0.397 | 0.490 | 0.000 | 0.000 | 1.000 |
| $\log(MV)_t$ | 1459 | 8.227 | 2.118 | 6.745 | 8.519 | 9.853 |
| $BM_t$ | 1459 | 1.094 | 6.907 | 0.317 | 0.496 | 0.768 |
| $Lev_t$ (%) | 1459 | 38.030 | 23.216 | 22.960 | 37.420 | 50.370 |
| $AbComp_t$ | 1459 | 0.232 | 0.322 | 0.010 | 0.010 | 0.396 |
| $\log(Assets)_t$ | 1459 | 15.670 | 2.375 | 14.055 | 15.979 | 17.213 |
| $CHS_t$ (%) | 1459 | 25.320 | 24.225 | 1.445 | 19.215 | 41.825 |
| $\log(Sales)_t$ | 1459 | 15.079 | 2.343 | 13.599 | 15.593 | 16.716 |
| $StockReturn_{t-1}$ (%) | 1459 | 1.157 | 0.753 | 0.847 | 1.099 | 1.319 |
| $ROA_{t+1}$ (%) | 1459 | 5.172 | 12.674 | 1.633 | 5.200 | 8.818 |
| $ROE_{t+1}$ (%) | 1459 | 12.371 | 47.944 | 5.325 | 12.930 | 20.610 |
| $EBIT_{t+1}$ (€ mn) | 1459 | 2185.194 | 4793.817 | 53.780 | 476.600 | 2208.000 |
| Panel B: Sample B | | | | | | |
| $\log(Wealth)_t$ | 850 | 7.507 | 2.262 | 6.555 | 7.753 | 8.947 |
| $Tenure_t$ (years) | 850 | 4.753 | 4.783 | 1.600 | 3.500 | 6.100 |
| $Dur_t$ (years) | 850 | 11.480 | 9.752 | 3.900 | 7.900 | 17.550 |
| $Dirs_t$ | 850 | 12.690 | 4.434 | 10.000 | 12.000 | 15.000 |
| $AlsoChair_t$ | 850 | 0.528 | 0.500 | 0.000 | 1.000 | 1.000 |
| $\log(MV)_t$ | 850 | 7.888 | 1.869 | 6.587 | 7.953 | 9.350 |
| $BM_t$ | 850 | 0.656 | 0.451 | 0.360 | 0.559 | 0.820 |

*Appendix C continues in the next page*

*Appendix C continued from the previous page*

| | N | Mean | Standard Deviation | 25th percentile | Median | 75th percentile |
|---|---|---|---|---|---|---|
| $Lev_t$ (%) | 850 | 37.450 | 22.659 | 22.530 | 37.790 | 50.240 |
| $AbComp_t$ | 850 | 0.227 | 0.312 | 0.010 | 0.010 | 0.363 |
| $\log(Assets)_t$ | 850 | 15.438 | 2.176 | 13.981 | 15.452 | 16.912 |
| $CHS_t$ (%) | 850 | 32.060 | 25.229 | 8.670 | 29.900 | 51.820 |
| $\log(Sales)_t$ | 850 | 14.868 | 2.080 | 13.490 | 15.000 | 16.459 |
| $StockReturn_{t-1}$ (%) | 850 | 1.148 | 0.852 | 0.848 | 1.099 | 1.314 |
| $ROA_{t+1}$ (%) | 850 | 4.921 | 13.100 | 1.860 | 4.790 | 7.860 |
| $ROE_{t+1}$ (%) | 850 | 9.018 | 30.228 | 5.272 | 11.670 | 18.565 |
| $EBIT_{t+1}$ (€ mn) | 850 | 1298.584 | 3048.615 | 42.037 | 304.050 | 1344.450 |
| Panel C: Sample C | | | | | | |
| $\log(Wealth)_t$ | 1232 | 7.939 | 2.396 | 6.890 | 8.263 | 9.484 |
| $Tenure_t$ (years) | 1232 | 4.750 | 4.506 | 1.700 | 3.600 | 6.250 |
| $Dur_t$ (years) | 1232 | 11.650 | 9.702 | 4.100 | 8.400 | 17.400 |
| $Dirs_t$ | 1232 | 12.270 | 4.356 | 9.000 | 12.000 | 15.000 |
| $AlsoChair_t$ | 1232 | 0.410 | 0.492 | 0.000 | 0.000 | 1.000 |
| $\log(MV)_t$ | 1232 | 8.202 | 2.092 | 6.733 | 8.521 | 9.774 |
| $BM_t$ | 1232 | 0.669 | 2.946 | 0.297 | 0.470 | 0.714 |
| $Lev_t$ (%) | 1232 | 35.460 | 20.556 | 22.560 | 35.810 | 47.450 |
| $AbComp_t$ | 1232 | 0.234 | 0.324 | 0.010 | 0.010 | 0.386 |
| $\log(Assets)_t$ | 1232 | 15.415 | 2.118 | 13.944 | 15.889 | 17.039 |
| $CHS_t$ (%) | 1232 | 25.110 | 23.422 | 1.700 | 20.910 | 41.410 |
| $\log(Sales)_t$ | 1232 | 15.138 | 2.227 | 13.889 | 15.617 | 16.643 |
| $StockReturn_{t-1}$ (%) | 1232 | 1.144 | 0.539 | 0.842 | 1.100 | 1.323 |
| $ROA_{t+1}$ (%) | 1232 | 5.714 | 13.152 | 2.825 | 5.840 | 9.325 |
| $ROE_{t+1}$ (%) | 1232 | 12.730 | 51.597 | 5.635 | 13.520 | 20.940 |
| $EBIT_{t+1}$ (€ mn) | 1232 | 1926.449 | 4655.288 | 49.697 | 449.755 | 1999.719 |
| Panel D: Sample D | | | | | | |
| $\log(Wealth)_t$ | 705 | 7.460 | 2.277 | 6.452 | 7.748 | 8.881 |
| $Tenure_t$ (years) | 705 | 4.807 | 4.908 | 1.700 | 3.600 | 6.000 |
| $Dur_t$ (years) | 705 | 11.710 | 9.976 | 4.000 | 8.000 | 17.900 |
| $Dirs_t$ | 705 | 12.400 | 4.237 | 10.000 | 12.000 | 15.000 |

*Appendix C continues in the next page*

| *Appendix C continued from the previous page* | | | | | | |
|---|---|---|---|---|---|---|
| | N | Mean | Standard Deviation | 25th percentile | Median | 75th percentile |
| $AlsoChair_t$ | 705 | 0.532 | 0.499 | 0.000 | 1.000 | 1.000 |
| $\log(MV)_t$ | 705 | 7.795 | 1.863 | 6.463 | 7.943 | 9.271 |
| $BM_t$ | 705 | 0.774 | 3.769 | 0.333 | 0.532 | 0.800 |
| $Lev_t$ (%) | 705 | 35.010 | 20.017 | 21.940 | 36.090 | 47.530 |
| $AbComp_t$ | 705 | 0.226 | 0.313 | 0.010 | 0.010 | 0.367 |
| $\log(Assets)_t$ | 705 | 15.162 | 1.915 | 13.817 | 15.337 | 16.756 |
| $CHS_t$ (%) | 705 | 31.620 | 24.352 | 10.040 | 29.900 | 51.120 |
| $\log(Sales)_t$ | 705 | 14.933 | 1.978 | 13.736 | 15.148 | 16.433 |
| $StockReturn_{t-1}$ (%) | 705 | 1.127 | 0.543 | 0.836 | 1.082 | 1.319 |
| $ROA_{t+1}$ (%) | 705 | 5.142 | 14.141 | 2.600 | 5.200 | 8.160 |
| $ROE_{t+1}$ (%) | 705 | 10.060 | 55.029 | 5.130 | 11.720 | 18.600 |
| $EBIT_{t+1}$ (€ mn) | 705 | 913.053 | 2189.198 | 37.467 | 296.000 | 1124.000 |

$\log(Wealth)_t$ = natural logarithm scaled total value of firm securities CEO owns cased on closing stock price of the annual report date in year *t*; $Tenure_t$ = number of years individual has been CEO in year *t*; $Dur_t$ = individual's duration of employment in the firm in year *t*; $Dirs_t$ = number of directors in board in year *t*; $AlsoChair_t$ = dummy variable indicating whether CEO is also chairman of the board (1 = yes, 0 = no) in year *t*; $\log(MV)_t$ = natural logarithm scaled total market value of the firm at year *t* end; $BM_t$ = book to market ratio of the firm at year *t* end; $Lev_t$ = leverage calculated as total debt divided with total capital in year *t*; $AbComp_t$ = abnormal compensation computed with equation (1) in year *t*, winsorized at 1% and 99% level; $\log(Assets)_t$ = logarithm scaled market value at year *t* end; $CHS_t$ = percentage of closely held shares in year *t*; $\log(Sales)_t$ = logarithm scaled gross sales in year *t*; $StockReturn_{t-1}$ = total return of firm's common stock in year *t*-1; $ROA_{t+1}$ = return on average of year *t*'s and year *t*+1's total assets; $ROE_{t+1}$ = return on average of year *t*'s and year *t*+1's equity in year *t+1*; and $EBIT_{t+1}$ = earnings of a firm before interest expense and income taxes in year *t*+1.