The Link Between Chief Executive Officers' Cash Bonuses and Return On Equity

— A Study of Swedish Firms

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This thesis quantitatively examines the relationship between executive compensation and firm performance for 120 companies listed on the OMX Stockholm stock exchange 2003 through 2007. We perform regression analysis of return on equity on cash bonuses. Our results indicate that there is no relationship between the two variables. This is in line with American studies which show weak or nonexistent relationships between cash bonuses and company performance. We hypothesize that this is largely due to the inflexibility of CEO cash bonuses. Previous research supports our findings that cash bonuses have low variance on a year-to-year basis.

Table of Contents

Introduction

Executive compensation has been in the midst of public debate throughout the last few decades, with public preoccupation occasionally reaching fever pitch. Select cases of executives being generously rewarded – often coinciding with layoffs or heavy losses – make headlines and the result is public debate.

Politicians have made efforts to reduce high payouts. Former US president Bill Clinton passed a law in 1992 restricting the tax deductibility of executive pay to $1 million. Current president Barack Obama recently passed laws restricting payouts in government bailed-out companies[1]. On the same note the European commission has recommended its member states to increase regulation on information in public companies regarding board and executive payment[2]. The Swedish government, among others, has followed this recommendation[3]. These regulatory changes have increased the information on executive pay available in annual reports of public companies.

Inferring from the above, policy makers and the public are often negative towards high bonuses. But, are they right to be? Are bonuses really just bad? Or, are they a useful tool for creating incentives for the management, leading to better firm performance to the benefit of shareholders?

Figure 1: Articles on bonus in Swedish newspapers

These questions stimulated our interest in executive pay and its incentive effects. We have chosen to perform a quantitative study on the relation between CEO bonuses and firm performance, using companies listed on the Stockholm Stock Exchange as our sample data.

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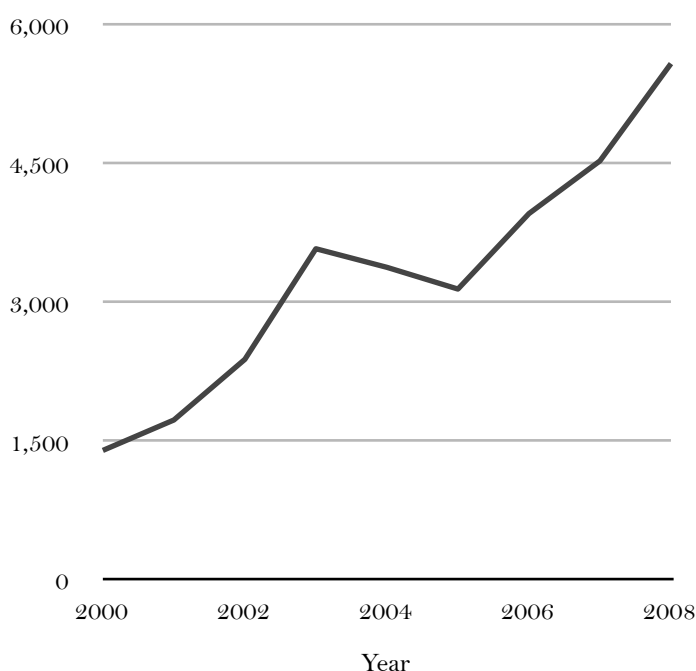
[1] The Economist (2009)

[2] European Commission (2004)

[3] Swedish Government (2005)

Purpose

The purpose of our study is to investigate whether there is a relationship between firm performance and CEO cash bonus payouts for listed Swedish companies.

Delimitations

This study will be limited to investigating the 120 largest companies listed on the Stockholm Stock Exchange between 2004 and 2007. Furthermore, we will only relate the cash bonus to firm performance: no other parts of incentive programs, if any, will be included in our analysis.

In the relationship between firm performance and the CEO bonus, as with any relationship between two variables, the first variable could be dependent on the second, the second could be dependent on the first, or the two variables could be interdependent. In our investigation there is no sure way of determining the direction of the causality, and nor is it the ambition of this thesis to do so. Therefore we will limit ourselves to investigate whether the relationship exists and if it does, quantify it.

Background
Theoretical Background: Principal Agent Theory[4]

Research on executive incentive remuneration is in most cases based on the principal-agent theory, either explicitly or implicitly[5]. The principal agent problem arises under conditions that involve asymmetric information (condition 1), and when a principal hires an agent to do work and the principal and agent have different interests (condition 2). In the specific situation that we are investigating, the principal is characterized by the shareholders, who hire a CEO, the agent, to maximize their own wealth. The CEOs know more about the operations of the company and their job (condition 1); they will also have an interest when performing their work which is not in the direct interest of the shareholder, namely to increase their own wealth (condition 2). They might also be interested in spending less time at work than the shareholders might want, or take actions other than the most profit-maximizing ones, which do not lie in the interest of the shareholders.

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[4] Early work that deal with principal agent theory include Ross (1973), Jensen and Meckling (1976), Holmstrom (1979, 1982) and Holmstrom and Milgrom (1987, 1991).

[5] Murphy (1999)
Owen et. al. (2004)

This leads to a problem – when interests of the shareholders and the CEO collide. Shareholders will do the best they can to align the CEO's interests with their own. This is where incentive systems comes into play. By establishing a structure, wherein the CEO's wealth is dependent on that of the shareholders, their interests are aligned by the CEO wanting to act in his own and thus the shareholders' interest. The so called agency cost can be reduced.

There are different ways to construct these incentives. Bonus systems are constructed so that the amount of remuneration received by the agent are dependent on the extent to which principal believe that the agent has taken the principal's desired actions. The shareholder's uncertainty regarding what the production function behind firm value looks like, and the trust that the CEO knows it better, often leads to contracts based on desired outcome (shareholder value) rather than waypoints – ends, rather than means.

Still, there are many interpretations of what really lies in the interest of the shareholders, and dubiousness as to whether the extrinsic incentives created by bonuses can put out intrinsic incentives. This uncertainty combined with the trade-off between agency cost and remuneration cost and other factors, have led to companies having the full spectrum of both type and magnitude when it comes to executive compensation schemes.

CEO Pay Structures

Although CEO pay practices differ across firms and industries, three basic components exist in most pay packages: a base salary, an annual bonus tied to accounting performance, stock options and often golden parachutes.[6] On top of these, long-term incentive systems are also common practice in the USA but uncommon in Europe and Sweden[7]. Perquisites and pension plans are often included in the packages.[8]

Most firms have part of the bonus tied to performance standards set by the remuneration committee or by the board. If a certain percentage of a goal value, called the bonus threshold, is reached, the bonus starts ticking. There is normally also a cut-off upper limit called the bonus cap. These

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[6] A golden parachute is a payment guaranteed to executives should they be dismissed, for example due to a merger or takeover.

[7] Abowd and Bognanno (1995)

[8] Murphy (1999)

two levels are typically at 80 and 120 percent respectively of the performance target for American companies[9]. On top of quantitatively measurable standards, there are qualitative goals – such as, "set up a new factory", "restructure the organization", etc. These are harder to measure, and it is up to the board to decide the final size of bonus that is to be paid out. Observing the logic and process behind the decision on the size of the bonus might be difficult in the cases with qualitative performance standards, which has contributed to the debate about bonus systems.

Incentive systems are either *implicitly* or *explicitly* related to performance. Pay based on qualitative goals, year-to-year changes (in either fixed salary level or performance standards) or maximum bonus size are examples of the former. Pay based on accounting returns or stock price appreciation are examples of the latter. These are often separated in research and treated independently[10]. Bonuses among Swedish companies are foremost explicitly linked to performance[11].

Previous Research

Research on executive compensation has been ongoing small-scale for a long time. An empirical study published in 1925 in the *Quarterly Journal of Economics* is recognized as the first in the area[12]. Thereafter, the first *major* work was done by Hertzberg et al. in 1959 showing that monetary incentives are effective for motivation only when they are dependent on performance and work to give recognition to the payee[13]. Research then surged during the 1980s, partly as a result of the highly publicized bonuses of the financial sector around Wall Street[14].

Most studies performed on executive compensation are American, and few have been European[15]. We have found few Swedish studies within the area. Therefore, the section generally describes results as found in international (and mostly American) studies.

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[9] Murphy (1999)

[10] Ibid.

[11] Rännar (2009)

[12] Gomez-Mejia and Wiseman (1997)

[13] Hertzberg et al. (1959), p. 118

[14] Murphy (1999)

[15] Main (2004)

The characteristics and international differences of incentive systems

Several interesting characteristics of executive compensation should be noted. It has been found that executive compensation as well as bonuses increase with firm size[16], which is not surprising, as bigger companies may require better qualified managers who are better paid. Studies imply that a ten per cent bigger company in terms of turnover normally pays their CEO three per cent more[17], and that this increase is inexplicably consistent across firms, time, industries and countries[18].

There have been international comparisons on executive compensation as well. These have been somewhat contradictory. Abowd and Bognanno (1995) show in a study amongst European countries, among them Sweden, that the size of the base wages and bonuses CEOs are consistently similar in Europe, but that the European levels are approximately half of those in the US[19]. On the other hand a later study by Schwalbach and Conyon (1999) describe big differences among European countries. For instance, they show that the bonus levels in the UK were the highest among the ten countries that were being compared, and roughly three times as high as in Ireland which had the lowest bonus levels.

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[16] Rosen (1982)
  Kostiuk (1990)
  Hengartner (2006)
  Baker et. al. (2004)

[17] Baker et. al. (1988)

[18] Rosen (1992)

[19] Abowd and Bognanno (1995)

Documented problems with incentive systems

According to a report by Tower Perrin[20], the performance standards used in determining the size of the CEO bonus are typically determined by accounting measures. Two fundamental problems with all accounting measures are described by literature[21]:

I. Bonus incentives influence business decisions. Managers who focus on maximizing their current bonus may let their bonus incentives determine business decisions. Accounting-based incentives only look backwards has recently occurred, favoring short terms decision. Executives can in this way improve short term return but reduce long term profitability, for instance by cutting research and development[22], or by choosing to make investments before or after the turn of a year.

II. Accounting measures can be manipulated. The officers can for example use accruals to shift income or costs from one period to another to maximize their bonus, as shown by Healy (1985)[23].

Combined with the system of bonus caps and bonus thresholds, further problems arise. Healy (1985), and Holthausen Larcker and Sloan (1995), show that managers use one or both of the above methods to avoid exceeding the bonus cap with too great a margin in a certain year. Doing so, they use the withheld effort next year, making it easier to reach bonus levels that year. Similarly, Healy also shows that when CEOs realize that they will not exceed the bonus threshold performance, they will try to adjust the result downwards the specific year, thereby making it easier to reach the incentive zone during the next.[24]

By far the two most common accounting measures for firm performance are the accounted profit compared to a set budget or compared to previous year results (in addition, the payout amount often allows for some board discretion based on non-disclosed criteria)[25]. Performance standards

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[20] Towers Perrin (1997)

[21] Murphy (1999)

[22] Dechow and Sloan (1991)

[23] Healy (1985)

[24] Holthausen et. al. (1995)
     Healy (1985)

[25] Tower Perrin's *Annual Incentive Plan Design Survey,* 1997.

based on a set budget gives a skewed incentive for CEOs in the budget process as the CEOs have an incentive to set the budget target on a sub-optimally low level in order to reach it easily and thereby maximize their bonus payout. When the performance standards are set on previous years, on the other hand, the CEOs know that they will be punished next year from performing well this year.

One originary problem derived from the construction of the incentive system. The CEO have a big impact on the construction of the incentive system.[26] This is obviously a problem, as the system that is supposed to align the CEOs' interests with those of the shareholder are to a large extent written based on the CEOs' interests[27]. This problem has been stressed by later studies[28].

The relationship between pay and performance

During the 1980s, the public as well as scientists started questioning whether bonuses really were effective. Since then, a multitude of studies have investigated the relationship between pay and performance. Two often cited studies are Jensen and Murphy (1990) and Leonard (1990).[29] These studies use somewhat different approaches. Firstly, the discussion of what measure to use for firm performance seem to have interested them. While Leonard looks for the relationship between ROE and the firm's incentive system, Jensen and Murphy use stock return. In neither study is there an explanation of why they have used the particular measure, but there are two different approaches being used here: the first study looks for the firm's financial performance, while the latter is rather concentrated on shareholder value.

Both studies find a significant positive relationship between their respective performance measure and the size of the bonus system. Jensen and Murphy quantify this relationship in the following way: "Our estimates of the pay-performance relation (including pay, options, stockholdings, and dismissal) for chief executive officers indicate that CEO wealth changes $3.25 for every $1,000 change in shareholder wealth".[30] This measure, the change in CEO wealth in dollars for each

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[26] Bebchuk and Fried (2004)

[27] Arye et. al. (2004)

[28] Hengartner (2006)

[29] Jensen and Murphy (1990)
   Leonard (1990)

[30] Jensen and Murphy (1990)

$1,000 change in firm wealth, is called the Jensen-Murphy measure and has been used in a number of studies since. Some of them have shown stronger pay performance sensitivities than the original study, most notably Aggarwal and Samwick, which showed a median change in CEO wealth of $13.78 per $1,000 change in shareholder wealth.[31] A study on pay variance for American CEOs find that firm performance only account for five percent of pay variance.[32]

Tosi and Gomez-Mejia (1989) find that the sensitivity between pay and performance is stronger in firms with a consolidated ownership, although there is a positive relationship between the two variables for other firms as well[33]. More recent research also suggests that firms with weaker corporate governance structures experience bigger agency problems, which in turn leads to a combination of worse firm performance, and higher CEO pay.[34]

Hall and Liebman's study examined the relationship between individual components of the CEO compensation and firm performance on a 15-year data set of the largest US publicly traded companies. They found a strong relationship between firm performance and CEO pay. The relationship was almost entirely generated by changes in the value of CEO holdings of stock and stock options and cash bonuses had little or no correlation to performance. Their explanation for this weak relationship was that it is hard for the boards to penalize and reward the CEOs using cash bonuses the way they want to, as they have incentive not to lower them too much – they do not want to reduce the CEOs pay – and they also have incentive not to make the cash payment too big, in order to avoid attracting media attention.[35]

Bebchuk and Fried (2004) argue that the problem of CEOs setting their own incentive systems can lead to "substantially inefficient arrangements that produce weak or even perverse incentives". They argue that this has skewed the incentive structures to such an extent that they no longer have any correlation with firm performance.

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[31] Aggarwal and Samwick (2003)

[32] Tosi et. al. (2000)

[33] Tosi et. al. 1989)

[34] Core et. al. (1999)

[35] Hall and Liebman (1998)

Previous Swedish studies

Executive compensation has not been extensively treated in Swedish academic research. Axelsson and Baliga (2007) treats problems of implicit incentive systems and manipulation of the same.[36]

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[36] Axelsson and Baliga (2007)

Methodology
Econometric Model

Our data have two dimensions: time and unit. This is known as panel data or cross-sectional time-series data. A simple linear panel data model could, if generalized, be described as

$$y_{it} = x_{it}\beta_{it} + \varepsilon_{it} \tag{1}$$

where β contains the partial effects of x in period t for unit i and ε the residual.[37] While this is theoretically a valid model, several assumptions are often made to make it practical and useful.

One basic assumption is that β is constant for all i and t, except for the intercept which is individual.[38] This assumption is the basis of all regression analysis, allowing us to make predictions as well as draw general conclusions on the data. The intercept can be understood as uncontrolled variables that differ between individuals, but which remain constant over time – in other words, a base-level for each company. Company culture, being company specific and fairly constant over time, is one example.

Further, the intercepts may be treated either as fixed variables (fixed effects) or as draws from a random distribution (random effects). For the latter it is assumed that these draws are independent of x.[39] Fixed effects always produce consistent results and provide information on the individual effects. Random effects do not always produce consistent results, but when they do, they do so more efficiently. To determine whether random effects can reliably be used, a Hausman Test[40] is used. We could not reject the null hypothesis in the Hausman Test, which means that there was no difference, indicating that either random and fixed effects can be used.[41]

Although the aforementioned test allows us to use the random effects model, we have opted for the fixed effects. This is because we are interested in measuring the company specific intercepts, which are not available using random effects.

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[37] Verbeek (2004), p. 342

[38] Ibid., p. 342

[39] Ibid., p. 348

[40] Hausman (1978)

[41] See Appendix A

A more elaborate version of the previous model (1) thus takes this form:

$$y_{it} = \alpha_i + \nu_t + \chi_{it1}\beta_1 + \chi_{it2}\beta_2 + \cdots + \chi_{itk}\beta_k + \varepsilon_{it}, \quad \varepsilon_{it} \sim IID(0,\sigma_\varepsilon^2)$$

The model variables are outlined in Table 1. More elaborate discussions on the variable choices follow.

TABLE 1: MODEL VARIABLES

Variable	Explanation
y	Measure of financial performance (dependent variable)
α	Firm-specific intercept. Unobserved firm-specific and time-consistent variables affecting y.
ν	Time-dummies
β	Co-efficients
ε	Error term
x	Explanatory variables (independent variables)
i	Unique firm
t	Time-period

Firm performance

The CEO position of any listed company is defined and controlled by the board of directors, which represents the owners. Thus, it is (indirectly) the owners who decide the size of the bonus system for the CEO. Consequently, a measure of firm performance that lies in the interest of the owners is suitable in this case. We have chosen to use return on equity as our performance measure, since it describes the return that the shareholders receive on their invested capital.

In past studies there have been examples of both ROE and stock price appreciation as a measure of firm performance[42]. Both measures have advantages and disadvantages, so it is desirable to use both.[43] Stock price appreciation includes actions taken which do not increase the bottom line di-

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[42] Examples include Leonard (1990) for ROE as the firm performance measure, and Jensen and Muprhy (1990) as well as Aggarwal and Samwick (2003) for stock price appreciation.

[43] Hirschey and Wichern (1984)

rectly, but which raise the potential for future profits, something that ROE does not include. However, the quantity paid out as bonus is often related to ROE when it is based on accounting-based performance standards[44]. Thus we have opted to use only ROE in our calculations, excluding market-value measures.

Return on equity is defined as net income (after preferred stock dividends, before common stock dividends) divided by total equity (excluding preferred shares) at the beginning of the fiscal year.[45]

Cash Bonus

We reasoned that the motivational impact of a bonus is determined by the relative change in income generated by the bonus rather than by the absolute amount of money that it gives. For instance, a bonus payout of SEK 100' it is a lot to someone who normally earns SEK 200' per year, but not as much to someone who earns SEK 2,000'. From that, we can conclude that a seemingly appropriate way of sizing up the bonus system is the variable payment expressed as a percentage of the fixed payment. In other words, we use a measure of how much the CEO has multiplied his income through the bonus system.

$$\text{Relative Bonus} = \frac{\text{Bonus}}{\text{Fixed Salary}}$$

We have not included pension funds, 'golden parachutes' or stock and stock option programs in our measure. The reason for not including pension funds is that they in most cases are part of the fixed payment and not affected by the CEO:s actions. The reason for not including 'golden parachutes' is that, although it is not part of the fixed payment, neither is it part of the bonus in that it does not vary with firm performance or other criteria set by the board. We have not included stock option programs as they are reported inconsistently[46], and sometimes contain forms of stocks and

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[44] Murphy (1999)

[45] Berk and DeMarzo (2007), p. 30

[46] Rännar (2009)

options specific that have no market valuation[47]. As bonuses are paid out the year subsequent to the year to which they attributable, we have led the relative bonus one year.

Control Variables

To be able to distinguish a link between firm performance and bonus we need to control a series of other variables, besides bonus, that are likely to explain firm performance. Firstly, we have controlled sales growth. Growth in sales have been shown to affect firm performance. Company size is assumed to bring economics of scale and is thus also included. Beta and leverage are two common measures of risk, which is known to have an impact on firm performance. We have used the latter.

TABLE 2: CONTROL VARIABLES

Explanatory Variable	Description	Examples from Previous Research
Growth	Sales growth	Capon et. al. (1990), Russo et. al. (1997), Huselid et. al. (1997)
Size	Natural logarithm of total assets	Russo et. al. (1997), Huselid et. al. (1997)
Leverage	Debt through equity	Hart et. al. (1996), Walter (1955)
Time	Dummy variables for each year	

Business cycles affect firm performance, and we have used yearly dummies to control for this effect.[48] Another option could have been to use a measure of economy-wide performance, such as a stock market index, as a control variable. All control variables were calculated directly from accounting data. Table 2 shows all control variables, with examples of previous research using them.[49]

Heteroskedasticity

We suppose the variance of the error term is variable, ε is said to be heteroskedastic. If so, the assumption on identically distributed error terms are unlikely to hold. This is often the case with

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[47] Murphy (1999)
Axelsson and Baliga (2004)

[48] Lee (2002), p. 7
Sandberg (2009)

[49] Measures on capital intensity, research and development as well as industry are some commonly used controlling variables that we did not include. The first and second was not readily available from our financial data source. The third did not have any significant explanatory value during our initial testings.

econometric data.[50] A White test can be used for testing whether heteroskedasticity exists for a given set of data. Performing such a test on our data confirms that heteroskedasticity is present.[51, 52] This is controlled for using heteroskedasticity-robust standard errors in the statistical software.[53]

Dependency

Use of the model outlined above requires choosing independent and dependent variables, affecting the choice of control variables among other things. This is different to correlations, which make no such distinctions. Determining the direction is difficult,[54] and outside the scope of this study. The bonus is being built up simultaneously with the creation of the company returns during the year, leaving options open in either directions.[55] We have chosen to make bonus the independent variable and firm performance the dependent in the regression. Using this causality direction in our statistical model is not a suggestion on the real state of dependency between the two variables.

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[50] Stock and Watson (2003), p. 128-129

[51] Messer and White (1984)

[52] See Appendix B.

[53] Williams (2000)
    Wooldridge (2002), p. 55

[54] Leonard (1990), p. 25

[55] Lyckeborg (2009)

Data

As a basis for our study we have chosen 120 companies from the Stockholm Stock Exchange[56]. We have selected the companies with highest average market capitalization, 2004 through 2007. This selection is conditioned by the availability of bonus data.

For select companies we have extracted financial data for the period using Orbis, a company information database from Bureau van Dijk. Data on bonuses was provided by Nordic Investor Services, on a confidential basis.[57]

We have excluded companies listed or delisted during the time period, reducing the number to 102. For several companies data on bonuses is missing for some, but not all, years. This is typically due to the company not reporting the bonus that certain year. The total number of observations are 339, compared to 408 if the data set had been complete.

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[56] The exchange has changed structure during the period. In October 2006 the old indices, *A-listan* and *O-listan*, at Stockholm Stock Exchange was transformed into OMXS-index, on a nordic exchange (OMX). It is this index we are referring to. Stockholmsbörsen AB (2005)

[57] Nordic Investor Services AB (2009)

Results

Descriptive statistics, correlations and panel data regressions are calculated using statistical software.

TABLE 3: DESCRIPTIVES

Variable	Observations	Mean	Std. Deviation	Min	Median	Max
Market Capitalization	436	22,812	49,767	0	5,527	409,869
Return on Equity	436	0.21	0.27	-2.35	0.22	2.26
Relative Bonus	351	0.47	0.62	0	0.36	4.26
Debt Ratio	431	1.75	4.76	0	0.45	32.8
Size	436	15.60	1.98	9.18	15.48	21.38
Growth	421	77	1186	-0.91	0.09	243.51*

* Although extreme, this is not an error. The company turnover increased from 335,000 SEK to 81,911,000 SEK for this particular year.

Table 3 gives a breakdown on the data. Market capitalization range from 409,896 MSEK down to 5,527 MSEK. Relative bonus range from 0 to 4.26. Figure 2 shows how average fixed salary and bonus has developed during the period. Not only has both fixed salary and bonus increased from 2003 to 2006. Relative bonus has increased too. Bonus payouts have increased from the average 58% of fixed salary 2003 to 63% 2006.
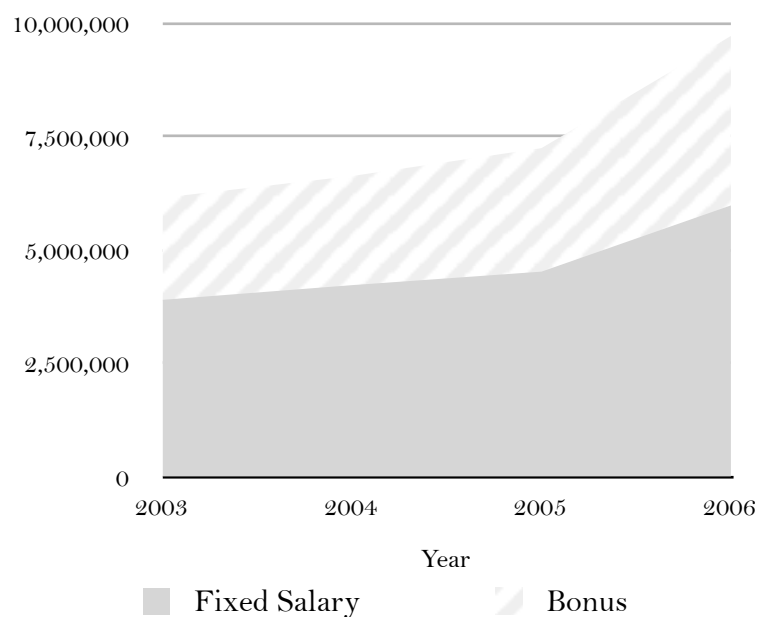
Figure 2: CEO Pay

Table 4 show that growth and relative bonus have a positive correlation. This could be due to bonus systems being based on, among other things, sales targets. Debt ratio and size is also positively correlated. Between the other variables no significant relationships can be identified. From evidence in Table 4 we conclude that neither relative bonus, debt ratio, size nor growth have any significant relation with firm performance. However, it is important to note that correlations take no consideration of temporal or individual dimensions.

TABLE 4: CORRELATIONS

	Return on Equity	Relative Bonus	Debt Ratio	Size	Growth
Return on Equity	1.00				
Relative Bonus	0.037	1.00			
Debt Ratio	0.0028	−0.0050	1.00		
Size	0.089	−0.077	0.49**	1.00	
Growth	0.065	0.32**	−0.045	−0.096	1.00

**p < .01, two-tailed test

In Table 5 we show the results from fixed-effects panel data regression. We find no significant explanation at a 5% significance level in the bonus measure. Neither do we find any explanation in the controlling variable debt ratio. Among the other controlling regressors size, growth and the yearly indicator variables all have significant explanatory value. All significant at the 0.01 level.

Figure 3: Return on Equity
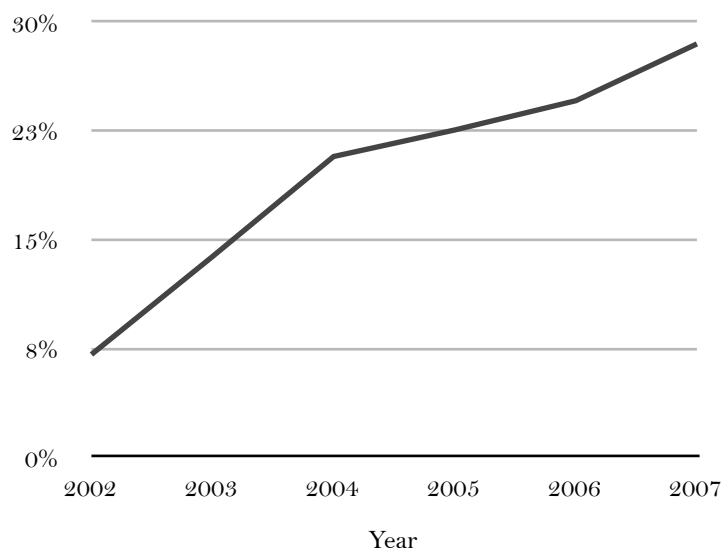
The yearly indicators have the largest 't' values, indicating that cyclical effects are present. Figure 3 shows return on equity for 2002 to 2007: the positive trend is clearly visible. This is echoed in the y2-4 yearly indicators, where the coefficients are increasing. This is likely to be part of the periodical business cycles. It is this effect that our yearly indicators act as a control for.

Growth is a significant controller, in line with previous research. Growth in sales from the previous year shows a positive association with company performance. Company size, too, is a significant controller. However, the sign is negative, and a positive sign was expected. The convex association implied by the logarithmic form of the company size variable suggests that return on equity falls at a decreasing rate as the company grows.

TABLE 5: REGRESSION[a] OF RETURN ON EQUITY ON RELATIVE BONUS, DEBT RATIO, SIZE AND GROWTH

Variables	b	s.e.
Relative Bonus	–0.0079	0.029
Debt Ratio	0.014	0.023
Size	–0.11*	0.041
Growth	0.076**	0.021
Year 2	0.073**	0.019
Year 3	0.12**	0.026
Year 4	0.21**	0.043
Constant	1.81**	0.64
R^2 (within)	0.202	
R^2 (between)	0.011	
R^2 (overall)	0.037	
F	6.89	
N	339	
I	102	

[a] Fixed effects panel data regressions using robust standard errors.
*$p < .05$, two-tailed test
**$p < .01$, two-tailed test

The constant is an aggregate of all company specific intercepts (α) – essentially the fixed effects. It is significant at the 0.01 level. From this we conclude that firm specific factors, besides those controlled for in our model, are associated with firm performance.

As Table 5 shows three coefficients of determination; R^2 (within) at 0.20, R^2 (between) at 0.01 and R^2 (overall) at 0.03. The first should be interpreted as the model's ability to account for variability in ROE, within the individual dimension. Since the fixed effects model captures the individual effects it is expected that R^2 (within) is the highest. The overall R^2 value is very low. In other words our model is good at explaining the within-firm differences, but less good at explaining the differences between firms.

Analysis

In this study, we have performed a regression on our panel data as described above. From performing this regression, we found no relationship between return on equity and cash bonus payout at a 5% significance level. Below, we will discuss the relevance and implications of this, discuss possible flaws in our method and compare our results to previous research.

Comparison to previous findings

Research on the pay-performance relationship has been done with different approaches and with different results. Some have used ROE as a measure of company performance and some have used the stock price appreciation. Leonard (1990) is one example of a study that uses ROE - in other words, it examines the pay-performance relation in a fashion similar to ours (although for different firms).[58] Leonard's investigation of listed American companies for the years 1980-1985 shows a relationship between CEO cash bonus and ROE that is, although weak, of significance, in contrast to our own results, which find no relationship of significance. Jensen and Murphy (1990) find a weak but significant relationship, where the discounted difference in cash bonus plus salary increases by 6 cents on average for every $1000 increase in firm value.[59] Hall and Liebman (1998), in agreement with our result, found no significant relation between cash bonus and firm performance.[60]

There might be national differences in the institutional environment between the US and Sweden, which makes these studies modestly comparable to ours. Discrepancies in our results from the above studies may also be explained by fast-moving policy change on matters of executive pay, and extensive documented changes in the magnitude and type of compensation. However, it is still worth noting that all previous research that we have found shows that the relationship of firm performance and cash bonus is either weak (in the words of the authors themselves) or nonexistent, in similarity with our results.

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[58] Leonard (1990)

[59] Jensen and Muprhy (1989)

[60] Hall and Liebman (1998)

Possible explanations of non-existent pay performance sensitivity

Given that no relationship exists between CEO pay and firm performance, it is interesting to speculate as to why.

One possible explanation is that cash bonuses are no longer being used by boards as motivational tools. A sign of this might be that bonuses are inflexible from year to year – according to Jensen and Murphy (1989), the CEO salary plus bonus payment is inflexible to the extent that the frequency distribution of annual percentage change of it is comparable to that of a sample of 1000 randomly selected workers' salaries. This could mean that instead of being used for creating incentives, bonuses have been transformed into a part of the ordinary salary, working rather to attract and keep CEOs than to motivate them to better performance.

On top of this hypothesis, there are a few additional ones that we would like to briefly mention considering previous research:

❖ *Manipulated Performance Standards.* CEOs can affect the performance standards after which their bonus payout is decided in ways other than maximizing shareholder value

❖ *Extensive CEO influence in the creation of the incentive system.* This problem refers to a study by Bebchuk and Fried (2006). However, it is possible that Sweden, having a different corporate governance structure from the USA[61] (where the study was performed) suffer less, or more, from this specific problem.

❖ *Bonus as a turnaround tool.* Many companies create incentive systems as a part of turnaround.[62] This means that when businesses perform badly, they all of a sudden adapt incentive systems, making the payout of bonuses somewhat U-shaped – they are paid out for the well performing companies, and for the really bad performing companies. This could perhaps be investigated by first testing this hypotheses, and thereafter doing an empirical investigation similar to ours but with adjustments for these specific outliers.

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[61] Lubatkin et. al. (2005)

[62] Leonard (1990)

❖ *Extrinsic motivation undermining intrinsic motivation.* This has been discussed within academic research to some extent[63] but the amount of research that has been done within the area is limited.[64]

To fully investigate these hypotheses is left for future research.

Implications

Agency theory is why performance based pay exist. The goal of incentive systems is to align interests by having the CEOs' wealth increase when the wealth of the owners is. Weak ties between pay and performance can be interpreted as misaligned interests between the CEO and the shareholders. Unaligned interests should worry shareholders.

In many cases, the agency problem at executive level is not in inducing the CEO to work harder, but in making the decisions that increase shareholder value.[65] The weak link between pay and performance found in this study could result in the CEO not making the decisions that maximize shareholder value to the best of his or her knowledge.

If bonus systems do not work in the sense that they do not align the interests of the CEOs with the interests of the shareholders, does that mean that companies should discontinue paying cash bonuses to their executives? Not necessarily. As stated above, bonuses might still work to attract the best fit managers to the company, and keep them in the position. Using Hertzberg's terminology,[66] the bonus might work more as a hygiene factor than as a motivator.

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[63] For example Kohn (1993), Frey and Osterloh (2004)

[64] Main (2004)

[65] Main (2004)

[66] Murphy (1999), p. 28

These implications are specific to the agency problem when studying the effect of cash bonuses. However, it could be that other compensation components, such as stocks and stock options, not included in our quantitative study, are keeping the interests aligned and thus compensating for the lack of motivational effects of cash bonuses. Such a conclusion would be in line with previous research[67].

Possible sources of error in the results

A possible source of error in our empirical investigation is that the data on bonus is collected in a survey among the companies' information departments, meaning that the companies themselves gave the figures of the bonus payout. The bonus data might have been measured differently among different companies, and some companies may be reluctant to share some or all data, fearing a besmirched public image.

A further weakness we have identified is that the low overall R^2 indicates that our model explain little of company performance. As a complex measure, more control variables would have been useful. As previously mentioned, research and development, capital intensity and industry are often used as controllers, but were not included in our model. Controlling for more performance related variables could therefore be beneficial.

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[67] Jensen and Murphy (1990)

Hall and Liebman

Aggarwal and Samwick (2003)

Main (2004)

Tosi and Gomez-Mejia (1989)

Concluding remarks

The purpose of this thesis was to investigate whether a relationship between CEO cash bonus and return on equity for Swedish companies listed on the Stockholm exchange could be established. It is a subject that has received much attention in Swedish press lately, as stated in the introduction. Columnists as well as journalists have in a few highly-publicized cases blamed boards for paying out bonuses regardless of the performance of executives.

Our results do indeed suggest that no relationship between cash bonus payouts and firm performance exists. From our results, it seems that return on equity cannot be explained with the help of cash bonuses paid to CEOs. In the analysis, we have discussed possible answers as to why no such relationship was found, including the low variances of bonus payouts and CEOs' manipulation of performance standards, amongst other factors.

Whether this lack of relationship is already known to board members and remuneration committees is interesting to speculate on – in other words, do the boards misfire when setting bonuses in pursuit of a motivational effect, or are bonuses set simply to keep the CEOs happy and not looking for other jobs? A recent comment by the Swedish industrialist Peter Wallenberg may give us a clue: "*Those who do not reach what gives the bonus payout should perhaps not stay with the company*"[68].

Regardless, boards should be aware that if they are looking to create incentives for their CEOs to increase the return on the shareholders' invested capital, they might want to have a look at other instruments than cash bonuses.

Suggestions for future research

Pay performance sensitivity among Swedish firms is still in large part under-investigated and there are several areas that would be interesting to delve deeper into. In addition to having more studies in the tracks of this thesis to confirm our results, it would be interesting to investigate the correlation between executive compensation and performance indicators other than return on equity. For example, Tobin's Q, or the stock price appreciation, to include investments deemed wise by the market, but that have not yet shown effect in the profit and losses account.

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[68] Strandberg (2009)

American research shows stronger pay performance sensitivities for stock and stock option programs than for cash bonuses. It would be interesting to gather data and seek the frequency and magnitude of such programs among Swedish listed companies, whereupon a study of the pay performance sensitivity of these pay components could be conducted. Such research, conducted within the institutional environment of Sweden, could hopefully lead firms to more effective incentive systems.

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Appendix A

Hausman test, indicating that there is no systematic difference in the coefficients. Both fixed and random effects can be used.

```
              ---- Coefficients ----
           |      (b)           (B)            (b-B)      sqrt(diag(V_b-V_B))
           |     fixed         random        Difference         S.E.
-----------+-------------------------------------------------------------------
  relbonus |   -.0078941     -.0168631         .008969         .0207039
  debtratio |    .014128      .0049387        .0091894         .0225763
      size |   -.1055822     -.0178984        -.0876838        .0384554
    growth |    .0764836      .0677549        .0087287            .
        y2 |    .0725184      .0611416        .0113768         .0046126
        y3 |    .1159374      .0901676        .0257698         .0179601
        y4 |    .2063842      .1829882        .0233961            .
-----------------------------------------------------------------------------
           b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

             chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =         4.56
           Prob>chi2 =       0.7140
           (V_b-V_B is not positive definite)
```

Appendix B

White test, detecting heteroskedasticity in the data.

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(29)     =      153.45
        Prob > chi2  =      0.0000

Cameron & Trivedi's decomposition of IM-test

-----------------------------------------------------
            Source |      chi2      df       p
-------------------+---------------------------------
 Heteroskedasticity |     153.45      29    0.0000
          Kurtosis |       1.37       1    0.2411
-------------------+---------------------------------
             Total |     154.82      31    0.0000
-----------------------------------------------------
```