Managerial compensation contracting

Engesaeth, E.J.P.

Publication date:
2011

Document Version
Publisher's PDF, also known as Version of record

Eric J.P. Engesaeth

Managerial Compensation Contracting

Tilburg University

Managerial Compensation Contracting

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit van Tilburg, op gezag van de rector magnificus, prof. dr. Ph. Eijlander, in het openbaar te verdedigen ten overstaan van een door het college voor promoties aangewezen commissie in de aula van de Universiteit op dinsdag 21 juni 2011 om 16.15 uur door

Ericus Johannes Paulus Engesaeth

geboren op 3 september 1978 te Amersfoort.

PROMOTORES:	Prof. dr. L.D.R. Renneboog
	Prof. dr. P.J.W. Duffhues
COMMISSIE:	Prof. dr. H. Van Ees
	Prof. dr. R. Kabir
	Dr. F. Braggion
	Dr. O.G. Spalt

To C.R.R.

Acknowledgements

I am deeply indebted to my supervisors Luc Renneboog and Piet Duffhues. Furthermore, I would like to thank the other members of the thesis committee for their valuable comments: Hans van Ees, Rezaul Kabir, Fabio Braggion and Oliver Spalt. With regard to the topic of simulation, I thank Jack Kleijnen for his insights. In addition, I am obliged to anyone who has directly or indirectly supported me during this journey. You know who you are.

Eric J.P. Engesæth

March 2011, Amsterdam

Table of contents

Chapter 1

Introduction

1.1 Introduction

Fischer Black (1986) points out, that as a result of noise we are forced to act largely in the dark. In this book, I have collected three research papers based on the common premise that an encounter between theory and practice can contrast noise with information, in the research area of managerial compensation. Based on my experience as a remuneration committee advisor, combined with the use of academic insights, it is the objective to contribute to the literature in three ways: i) Open the black box of the executive remuneration decision; ii) Capture the executive remuneration structure in a single quantifiable yardstick; iii) Work with a new and potentially unique dataset on profit centre head remuneration. I will further elaborate on this in section 1.3, in which the outline of the book and the research questions are discussed. The upcoming section 1.2 provides three anchor points for the sake of readability.

1.2 Anchor points

1.2.1 Managerial compensation contracting: society is watching

Chief Executive Officers (CEOs) of large corporations are among the best paid individuals in our society. In terms of the Dutch environment, CEOs of AEX-listed companies earn multiples of the salary of the Prime Minister of the Netherlands and typically more than pilots, college professors, lawyers, surgeons, etc.[1] It is no wonder, therefore, that CEO remuneration contracts are the object of considerable attention and scrutiny. The topic of executive compensation and CEO compensation in particular, is discussed, among other places, on social networks, in the popular press, at shareholder meetings, in the political arena and, last but not least, in the academic world. These discussions concern the total level of compensation, the increase in compensation over time (in absolute or relative sense), the determinants of CEO pay, the (in)sensitivity to firm performance, international pay differences, etc.

Given the emotions that sometimes accompany the topic of executive compensation, it is the task of academia to bring facts into the equation. This can only be achieved if there is a bridge

---

[1] For example, refer to the article ‘Wie verdient wat?’, Elsevier, 24 June 2010, which reflects salary levels of 257 jobs in the Netherlands.

of communication between academics and practitioners. Given my dual background of working as a remuneration committee advisor, on the one hand, and an academic researcher, on the other, I have taken this into account as an anchor point.

1.2.2 Corporate finance theory and beyond

Corporate finance theory is my starting point for studying managerial compensation issues within firms. Financing these enterprises implies raising and investing capital to create unique combinations of physical and human capital. There is a difference between financing physical capital, on the one hand, and human capital, on the other. Physical assets, such as a machine that produces product 'X', can be financed by multiple financial instruments, typically using some form of longer-term debt or equity. The method of finance can change the cost of capital (and consequently the company's value) but not the return of the machine directly. With regard to financing (managerial) human capital, there is an added dimension: the way it is financed can also result in a varying return. Under the assumption that financial incentives drive people's behaviour, providing a CEO with share-based payments provides an incentive to take NPV > 0 actions and could result in a higher return for the company. So the need for outside debt and equity in the 'modern (industrial) corporation', on the one hand, creates an agency problem that, on the other, can also be resolved in part by the way the company and, specifically, human capital are financed. The three main areas in corporate finance, reflected in table 1.1, provide context for analysing the assumed conflict between shareholders and management and are implicit anchor points throughout this paper.

Table 1.1: Corporate finance building blocks in relation to executive remuneration

Element	Comments
Capital structure	In light of the agency problem, the optimal capital structure strikes a balance between debt and equity to limit perk consumption (disciplinary role of debt), and financial distress/taking excessive risks, in order to minimise overall agency costs. It is widely accepted that agency problems can often be reduced more efficiently by introduction of an (optimal) incentive scheme. This implies a shift away from using the entire company's financial structure towards contract theory.
Corporate governance	There are several ways to define corporate governance. In a broad sense, it deals with the ways in which suppliers of finance to corporations ensure obtaining a return on their investment. Good governance is needed as the market does not allocate all resources efficiently without intervention from above. The market has its costs and firms alleviate these costs by replacing the price mechanism with the exercise of authority. At listed companies, management does not own the company but largely controls it. Corporate governance studies how authority is allocated and exercised; how do suppliers of finance control managers?
Valuation	The value of a firm equals the discounted sum of payoffs generated by the firm minus the opportunity cost of the inputs used, minus rents paid out to production factors (such as labour/human capital). Rents in this respect refer to the price paid above the opportunity cost. Unionised workers, for example,

Element	Comments
	tend to be paid above their opportunity cost. Some researchers argue that top-executives also derive rents from the company (for example as a result of a lack of corporate governance). The valuation of the firm is furthermore important since creating (shareholder) value is the primary goal of a company in neo-classical finance theory. An optimal incentive contract should take this objective (goal alignment) into account.

While corporate finance theory is my point of departure, the executive compensation literature is interdisciplinary by nature, and fertile ground for study.[2] I will use an eclectic approach to marry theoretical insights and practical experience.

1.2.3 Remuneration level and structure (ex ante versus ex post compensation)

This book divides managerial compensation into its 'level' and 'structure'. The level primarily relates to the ex-ante price level of human capital (also referred to as 'expected' or 'on target' compensation). The structure relates to the design of the pay contract which, in combination with the achieved performance level, results in ex-post or realised compensation. Table 1.2 provides an example.

Table 1.2: Illustration of ex-ante versus ex-post compensation of a CEO

This table shows the direct compensation elements of a CEO remuneration contract. The variables are: i) 'Base salary' which equals fixed compensation/non-contingent pay, including items such as 13th-month salary, vacation allowance plus other non-performance-related allowances; ii) 'Short-term incentive' which equals the annual bonus; iii) 'Long-term incentive' which equals the annualised expected value of long-term incentive awards such as stock options, share grants and other long-term rewards; iv) 'Total direct compensation' which equals the sum of these three elements. The ex ante or expected total direct compensation level equals € 3,000,000. Based on different states of the world (here: *bad company results* and *good company results*), the ex post or actual remuneration ranges between € 1,750,000 and € 4,250,000.

	Ex post value of compensation – *bad company results*	Ex ante value of compensation	Ex post value of compensation – *good company results*
Base salary	€ 1,000,000	€ 1,000,000	€ 1,000,000
Short-term incentive	€ 250,000	€ 500,000	€ 750,000
Long-term incentive	€ 500,000	€ 1,500,000	€ 2,500,000
Total direct compensation	€ 1,750,000	€ 3,000,000	€ 4,250,000

2 For example, managerial compensation contracting has received ample attention in the legal and accounting literature. Another example is the work of Nobel Prize laureate Daniel Kahneman. From a psychologist's perspective, he analyses ways in which economics has traditionally misunderstood human behaviour. For example, these maps of bounded rationality explore the heuristics that people use, decision making under risk, and framing effects with their implications for rational-agent models (Kahneman, 2003). Acknowledging that economic agents, including the contracting parties (e.g. CEO and remuneration committee), are only bounded rationally is essential to understanding the executive remuneration decision and the existing remuneration landscape.

The division between ex ante and ex post remuneration is my final anchor point. It suggests that remuneration contracts can differ in terms of: i) the level of the ex ante compensation; ii) the remuneration structure, which determines the actual payment in different states of the world.

1.3 Chapter overview

As mentioned in the first section of this introduction, the objective of this thesis is to add to the managerial compensation contracting literature in three ways: i) Open the black box of the executive remuneration decision; ii) Capture the executive remuneration structure in a single quantifiable yardstick; iii) Work with a new and potentially unique dataset on profit centre head remuneration. The chapters of research are based on these three approaches, as set forth.

1.3.1 Chapter 2: The Executive Remuneration Decision

Drafting a remuneration policy, i.e. setting remuneration levels and designing a remuneration structure, in large corporations, is essentially performed by the remuneration committee.[3] Given that bounded rationality, labour market imperfections, and the importance of process are acknowledged, questions regarding the role of the remuneration committee and its decision-making methodology become relevant. There is a vast body of literature that looks from the outside in, which transforms the executive remuneration decision process into a black box. Collecting data and testing hypotheses based on different theoretical models, has resulted in a debate among various traditions that claim to explain remuneration practices. Because there is no theoretical model that really applies, some scholars argue that this has fragmented the debate. Therefore, in chapter 2 my objective is to comment on some of the existing theoretical anchor points from a practical view, focusing on the role of the remuneration committee and its decisions. An eclectic perspective is taken, resulting in four lenses that summarise the practical comments. The combination of these lenses can be used to enhance the setting up and interpretation of future empirical research. Furthermore, it provides company stakeholders with ways to analyse the executive compensation process, as well as the resulting decisions on level and structure.

The following research questions form the basis of the chapter outline: 1) What does the top executive remuneration landscape look like (level and structure)?; 2) What is the role of the remuneration committee in the executive *remuneration level* decision?; 3) What is the role of the remuneration committee in the executive *remuneration structure* decision?; 4) How are real-life executive remuneration decisions made?

---

[3] In this thesis I will use the term remuneration committee and compensation committee interchangeably. I will assume that it represents the full (supervisory) board in its decisions.

1.3.2 Chapter 3: Executive Remuneration Structure and the CompRisk Index

Shleifer and Vishny (1997) conclude their survey of corporate governance with the following question, among others, for further research: 'Given the large impact of executives' actions on values of firms, why aren't very high powered incentive contracts used more often in the United States and the rest of the world?' Meanwhile, this question has been answered. Too much of a good incentive results in counterproductive behaviour. Incidence of backdating stock options, misstatements, fraud, overvalued equity and financial distress have been linked to measures of incentive strength, such as the exposure to stock option gains and losses, Denis et al. (2006), Bergstresser and Philippon (2006), Cullinan et al. (2006), Jensen (2005), Efendi et al. (2004), Tian (2004).

Incentives can be classified into portfolio- and performance-incentives. The first category refers to the structure of the CEO's portfolio of stock options and shares which are (assumed to be) part of his wealth. The sensitivity of CEO wealth to share price movements (delta) and to share return volatility (vega) has been widely researched both analytically and empirically, among others Hemmer et al. (1999), Guay (1999) and Coles et al. (2006).[4] The second category refers to the structure of unvested rights, including the short-term incentive and the long-term incentive plans. In comparison to the first category, there is a fundamental difference. Shares and option portfolios in the first category can be directly linked to share price movements and return volatility. In contrast, the assessment of performance-incentives follows a two-staged approach. The underlying option and/ or share vehicle needs be taken into account, but even more important is the performance condition. It determines whether or not there will be an addition to the portfolio or not.[5] For the research in chapter 3, I will focus on the second category from an ex ante perspective.[6]

---

[4] Note that a related stream of research focuses on the implications of the magnitude of the portfolio on the value of compensation, from the perspective of the executive. It concludes that if a risk-averse manager has a significant part of his wealth tied to his firm's stock price, the certainty equivalent value of that compensation contract can be substantially less than its cost as perceived by shareholders, e.g. Lambert et al. (1991), Hall and Murphy (2002). Valuation of the executive compensation contract from the perspective of the executive is not my objective. This would involve making assumptions on the risk preferences of the CEO. In contrast, the goal is, based on the perspective of the company and based on the valuation tools that are used in practice for IFRS 2 accounting, to establish a consistent measure that can capture the variability of future remuneration policy payments.

[5] Such a performance condition can become quite elaborate. For example, within a relative total shareholder return plan, not only the price path of the company should be simulated, but also the price paths of the companies in the reference group (sometimes over 100 companies). The analyses of possible future payouts furthermore needs to take into account the payout curve, which determines the payment in each possible state of the world.

[6] Note that the pay-for-performance literature has focused on the ex post perspective. At the moment the package is realised the executive is no longer at risk and therefore this moment is not suited for a risk analysis in the second category (performance incentives). Only if payout is in shares or options and these vehicles remain part of the wealth of the CEO, a risk exposure analysis can be executed. However, this would fall in category one (portfolio incentives).

A typical measure of ‘compensation at risk’ in this stream of research is the pay mix, i.e. variable compensation divided by total compensation. It is my objective in chapter 3, to improve this proxy by taking into account underlying contract details. The compensation risk index (or CompRisk index) that I put forward, is based on the coefficient of variation and measures the variability of each unit of expected reward. In this light it is closely related to the inverse of the Sharpe ratio (1966, 1994), but free from the noise that would be introduced by the need for a relevant risk free human capital benchmark. The CompRisk index can be used by researchers to capture the remuneration structure in a single quantifiable yardstick. This enables research on the determinants of observed remuneration structures.[7] Remuneration committees can use the tool to balance risk and reward in executive compensation contracts. The CompRisk index has the potential to reinforce the bridge between theory and practice, because the underlying techniques are based on the international financial reporting standard 2, which is followed by companies in light of the valuation of share-based payments for the accounting statements.

Besides developing the CompRisk index and presenting the observed landscape of CEO compensation risk in the Netherlands and the UK, I explore the use of the measure and research its determinants. The research is based on a dataset of handpicked CEO-contract information of the largest listed Dutch and UK firms over the 2001-2008 period.[8] The data cover all industries.

The following research questions form the basis of the chapter outline: 1) How to define a single quantifiable metric that can capture the structure, risk or incentive strength of yearly compensation contracts?; 2) What is the level of risk in real-life compensation contracts in the Netherlands and the UK?; 3) How can the CompRisk index be used?; 4) What are the determinants of compensation risk, as measured by the CompRisk index?

1.3.3 Chapter 4: Determinants of Profit Centre Head Remuneration

In the quest for survival, businesses try to obtain a strategic advantage. This can be achieved by means of optimally financing the business, developing a superior strategy and executing this strategy. It goes without saying that human capital is indispensable in this equation; i.e. attracting the best people to the organisation, retaining them and motivating them to deploy their abilities at the benefit of the company. It can be safely assumed that the success of the business

---

[7] It can also be used as a proxy for CEO risk acceptance or as a right-hand-side variable in research on managerial risk taking.

[8] The dataset focuses on the largest listed companies (scope figures for the companies in the dataset are presented in section 3.3). This may imply that the research is not representative for small and / or non-listed companies. This is a limitation.

is a positive function of the amount of talent in the organisation. Human capital becomes additionally important when one moves up the corporate ladder. This is because decisions geometrically affect the organisation; positively or negatively. The CEO has final decisive power. However, an important part of his power is cascaded to managers, so called profit centre heads (PCH), that report directly or indirectly to him. These individuals have profit & loss responsibility for a part of the business and / or are jointly responsible for the total company. In light of the aforementioned topics of attraction, retention and motivation, as well as the general topic of optimally financing the business, this topic is of interest to the academic world (Bushman, Indjejikian & Smith, 1995).

However, research on executive remuneration typically focuses on the CEO and/or executive board, whereas the level below the board remains invisible. This is the case, because detailed profit centre head (PCH) information for the layer below the top of the corporate hierarchy is scarce for the U.S. (Fisher and Govindarajan, 1992). It is even scarcer for European firms. Because it is considered private information, empirical research on this subject is difficult to execute. We therefore provide such research in chapter 4, based on a unique dataset of 645 European firms covering 16,415 CEO/PCH observations over the 2000-2008 time span, made available by Towers Perrin.[9] The objectives are to execute a broad research on the (time variant and invariant) determinants of PCH remuneration, the pay gap with the CEO and to use a PCH performance proxy to establish a measure for CEO excess remuneration. We follow a new approach for this line of research that strictly separates between ex ante (expected) compensation at t=0, and ex post compensation at the moment of realisation. This allows for more detailed conclusions.

The following research questions form the basis of the chapter outline: 1) What are the determinants of profit centre head remuneration?; 2) What are the determinants of the CEO-PCH remuneration gap?; 3) Do CEOs have more power to influence their actual bonus than PCHs?

1.3.4 Outline of the book

Each of the research chapters 2, 3, and 4 can be read independently from the other chapters. Chapters start with an introduction in which the objective and the research questions are

---

[9] The dataset focuses on large companies (scope figures for the companies in the dataset are presented in section 4.2). This may imply that the research is not representative for small companies. This is a limitation.

described, and end with a summary and conclusion, followed by an overview of references, summary of research variables (chapter 3 and 4) and other appendices.

Table 1.3 Outline of the book

This table shows the structure of the remainder of this book. Besides the introductory chapter, the book consists of three research chapters. For each chapter, a brief description, the underlying sources, geographical focus of the data, and position focus are shown.

Chapter title	Brief description	Underlying sources	Geographical focus	Position focus
Chapter 2: The Executive Remuneration Decision	Overview of various aspects of CEO contracts throughout Europe and U.S. (2006) followed by an eclectic perspective to understand executive remuneration decisions observed in practice	i) Experience in the field as a remuneration committee advisor; ii) survey research; iii) literature research	Western European countries & United States	Chief Executive Officer
Chapter 3: Executive Remuneration Structure and the CompRisk Index	Design of a single quantifiable metric to capture the structure of the executive compensation contract in order to facilitate (future) empirical research and real-life decision making	CEO remuneration contract data handpicked from public sources	The Netherlands, United Kingdom	Chief Executive Officer
Chapter 4: Determinants of Profit Centre Head Remuneration	Empirical research on the determinants of PCH compensation, in absolute terms and relative to the CEO	Proprietary dataset on PCH remuneration (Towers Perrin)	Western European countries	Profit centre heads (reporting to the Executive Board)

1.4 References

Bergstresser, D., Philippon, T. (2006), 'CEO Incentives and Earnings Management', *Journal of Financial Economics* 80, 511-529.

Black, F. (1986), 'Noise', *The Journal of Finance* 41 *(3)*, 529-543.

Bushman, R.M., R.J. Indjejikian, Smith, A. (1995), 'Aggregate Performance Measures in Business Unit Manager Compensation: The Role of Intrafirm Interdependencies', *Journal of Accounting Research* 33, 101-128.

Cullinan, C.P., Du, H., Wright, G.B. (2006), 'A Test of the Loan Prohibition of the Sarbanes-Oxley Act: Are Firms that Grant Loans to Executives More Likely to Misstate Their Financial Results?', *Journal of Accounting and Public Policy* 25, 485-497.

Denis, D.J., Hanouna, P., Sarin, A. (2006), 'Is There a Dark Side to Executive Compensation?', *Journal of Corporate Finance* 12, 467-488.

Efendi , J., Srivastava, A., Swanson, E.P. (2007), 'Why Do Corporate Managers Misstate Financial Statements? The Role of Option Compensation and Other Factors', *Journal of Financial Economics* 85, 667-708.

Elsevier (2010), 'Wie verdient wat?', 24 June 2010.

Fisher, J., Govindarajan, V. (1992), 'Profit Centre Manager Compensation: An Examination of Market, Political and Human Capital Factors', *Strategic Management Journal* 13, 205-217.

Jensen, M.C. (2005), 'The Agency Costs of Overvalued Equity', *Financial Management* 34, 5-19.

Kahneman, D. (2003), 'Maps of Bounded Rationality: Psychology for Behavioral Economics', *The American Economic Review* 93, 1449-1475.

Shleifer, A., Vishny, R. (1997), 'A Survey of Corporate Governance', *The Journal of Finance*, 52, 737-775.

Tian, Y.S. (2004), 'Too Much of a Good Incentive? The Case of Executive Stock Options', *Journal of Banking & Finance* 28, 1225-1245.

Chapter 2

The Executive Remuneration Decision

2.1 Introduction

The objective of this book, is to add to the managerial compensation contracting literature in three ways: i) Open the black box of the executive remuneration decision; ii) Capture the executive remuneration structure in a single quantifiable yardstick; iii) Work with a new and potentially unique dataset on profit centre head remuneration. In this research chapter, I focus on the first approach mentioned. Drafting the remuneration policy, i.e. setting remuneration levels and designing a remuneration structure, with performance measures, payment vehicle, payment zone, etc., in large corporations is effectively performed by the remuneration committee. What exactly is its role and how are decisions reached?

There is a vast body of literature that looks from the outside in, which transforms the executive remuneration decision process into a black box. Collecting data and testing hypotheses based on different theoretical models, has resulted in a debate among various traditions that claim to explain remuneration practices. Because there is no theoretical model that really applies, some scholars argue that this has fragmented the debate. In this research chapter the objective, therefore, is to comment on some of the existing theoretical anchor points from a practical view, focusing on the role of the remuneration committee. An eclectic perspective is taken, resulting in four lenses that summarise the practical comments. The combination of these lenses can be used to enhance the setting up and interpretation of future empirical research. Furthermore, it provides company stakeholders with a tool to analyse the executive compensation process and the resulting decisions on level and structure. [10]

I will combine data of the European executive remuneration landscape, based on our research for the Dutch Corporate Governance Code Monitoring Committee (2007), with theoretical literature research[11] as well as practical experience in the field, working as a remuneration committee advisor.

---

[10] In the Netherlands, since the introduction of the 'Tabaksblat Code' in 2004, shareholders adopt the remuneration policy of the Board of Management and approve the long-term incentive plan. Furthermore, the staff council has an advisory voice to the AGM regarding Board of Management compensation (change of article 2:135 BW as per July 1, 2010; www.justitie.nl).

[11] Theoretical insight is obtained by studying academic papers and books. Over 250 references are incorporated in this chapter.

2.1.1 Research questions

The objective is to comment on some of the existing theoretical anchor points from a practical view, focusing on the role of the remuneration committee and its decisions. An eclectic perspective will be taken, resulting in four lenses that summarise the practical comments. In section 2.2 to 2.5, I will follow the process of answering four underlying research questions as shown in table 2.1.

Table 2.1: Research questions

This table provides an overview of the research questions of this chapter, the objectives, and the reference to the relevant section.

Research questions	Objectives	Section
1) What does the top executive remuneration landscape look like (level and structure)?	The objective is to provide an overview of market practice for the largest listed companies in the Netherlands, relative to 6 other European countries as well as the U.S.	2.2
2) What is the role of the remuneration committee in the executive *remuneration level* decision?	The objective is to provide an overview of the fundamental characteristics of the pricing mechanism in the CEO labour market segment. Practical comments are based on the role of the remuneration committee.	2.3
3) What is the role of the remuneration committee in the executive *remuneration structure* decision?	The objective is to provide an overview of the advances that have been made in the contract literature. Practical comments are based on the role of the remuneration committee.	2.4
4) How are real-life executive remuneration decisions made?	The objective is to summarise the practical comments, into an eclectic perspective. The combined four lenses can be used to analyse the executive remuneration decision.	2.5

2.1.2 Research structure

The remainder of this chapter is structured as follows: section 2.2 starts with an overview of the European executive remuneration landscape, focusing especially on the remuneration policy for the CEO position. The policy determines how the remuneration level is established and what the remuneration structure looks like. Differences per company and/or country are described and require a further analysis of the theoretical anchor points of remuneration policies within the practical context of the role of the remuneration committee. With regard to the remuneration level, section 2.3 provides the fundamentals of the CEO labour market segment, and describes the role of the remuneration committee (see section 2.3.4). With regard to the remuneration structure, section 2.4 describes the fundamentals of incentive contracts and the role of the remuneration committee (see section 2.4.4). Section 2.5 summarises the practical comments into an eclectic perspective to provide insight in the executive remuneration decision. Section 2.6 ends this chapter, with a summary and conclusion.

2.2 The executive remuneration landscape

This section provides an overview of the Dutch executive remuneration landscape in a European and U.S. context. The objective is to obtain an overview of remuneration policy market practice among the largest listed companies in Europe, based on public as well as proprietary data. For this purpose, in 2007, a questionnaire (see appendix 2.1) was drafted and sent out to seven Towers Perrin offices in Europe (the Netherlands, United Kingdom, Germany, France, Belgium, Italy and Sweden), as part of our research for the Dutch Monitoring Committee Corporate Governance Code. For each country, it was decided to focus on the constituents of the most important stock market index. In order to provide additional context, we also sent the questionnaire to the New York office of Towers Perrin to obtain a U.S. view as well. The data is therefore representative for the largest listed companies in each of the markets. Because these companies are typically early adopters, the results may represent a broader market trend as well. Table 2.2 provides an overview of the country and company focus:[12]

Table 2.2: Country and company focus of research

This table provides an overview of the researched countries and companies.

Country	Company focus
The Netherlands	AEX 25
United Kingdom	FTSE 30
Germany	DAX 30
France	CAC 40
Belgium	BEL 20
Italy	MIB 30
Sweden	OMXS 30
United States	Fortune 500

Our special interest focuses on the way compensation packages are set up and in what type of structures they are operated: short-term versus longer-term focus, how targets are determined, what type of vehicles and performance measures are used, etc. In this light, we will first provide the country specific corporate governance context in which these decisions are made (see section 2.2.1) Subsequently, the results of the survey are reflected in terms of compensation level (see section 2.2.2), and compensation structure (see section 2.2.3).

[12] The questionnaires have been developed by the research committee of the Monitoring Committee Dutch Corporate Governance Code (2007), based on typical survey questions of Towers Perrin. All questionnaires have been filled out by local consultants in the relevant countries. I have processed these questionnaires into a view of each market. Some information will be presented at a higher-level than other information, to ensure that Towers Perrin is not in breach of contract with their clients, given the proprietary nature of some of the data.

2.2.1 Corporate governance context in which remuneration decisions are made

Executive remuneration contracts are part of a broader set of governance mechanisms that together form the corporate governance system. According to Renneboog (2005), these mechanisms ensure or should ensure that management, referred to as the agent, runs the firm for the benefit of one or more stakeholders, referred to as the principals. This is a broad view of corporate governance. In the Anglo-American literature, corporate governance is often defined more narrowly. Shleifer and Vishny (1997), for example, state that corporate governance deals with "the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment". They state that product market competition, one of the most powerful forces towards economic efficiency in the world, cannot solve this problem satisfactorily. This is because markets are not perfect and, once capital is sunk, managers can expropriate the return. Thus, corporate governance mechanisms should ensure that investors are assured they get a return on this capital. Table 2.3 shows the main characteristics of the transatlantic corporate governance players (McCahery and Khachaturyan, 2006).

Table 2.3: Main characteristics of transatlantic corporate governance players

Country	United States	UK	Germany	France	Italy
Employees	- Flexible labour -Low unionisation - Employment at will	- Flexible labour market	- Staff councils - Co-determination - High skills - Non-flexible labour market	- Staff councils - Low unionisation - Short-term contracts	- Long-term contracts - Rigid labour market - Medium skills
Shareholders[13]	- Institutional investors and individuals - Dispersed	- Institutional investors - Dispersed	- Other non-financial companies - Banks	- Foreign investors - State	- State - Families
Government	- Liberal policies - Arm's length - Weak takeover barriers	- Liberal policies - Arm's length - Weak takeover barriers	- Protectionist policies - Medium takeover barriers	- Protectionist policies - Interventionist - Medium takeover barriers	- Protectionist policies - Interventionist - Strong takeover barriers
Boards of directors[14]	- High activism - High percentage of outsiders due to investor pressure	- High activism - High percentage of outsiders determined by law	- Moderate activism - Stakeholders as a significant minority - Medium size	- Moderate activism - Minority of outsiders - Medium size	- Low activism - Large % of insiders - Medium size

[13] The impact of country differences also holds for the related topic of capital structure. De Jong, Nguyen and Kabir (2008) show that country specific factors matter. In a better legal environment and more stable and healthier conditions (creditor right protection, GDP growth, etc.), firms are likely to take more debt.

[14] Board structures can be grouped into three main types: i) The two tier-system, e.g. Germany and the Netherlands; ii) The fully unitary system, e.g. the UK, U.S. and Italy: this is where there is a single Board made up of executive management and non-executive directors; iii) A system of two Boards, one executive and one non-executive, e.g. Belgium and majority of French and Swedish companies: some executives, particularly the CEO, will also sit on the non-executive Board. In some countries, multiple board structures are observed, e.g. Italy, the Netherlands, and France. The vast majority of companies

Country	United States	UK	Germany	France	Italy
Top management team	- Professional (finance/MBA) background - Some foreign-born management - Open labour markets	- Semi-professional background - Some foreign-born management - Open labour markets	- Technical background - Few foreign-born managers - Closed labour markets (long-term)	- Common educational backgrounds - State links - Few foreign-born managers - Closed labour markets (long-term)	- Non-professional - No foreign-born management - Closed labour markets (long-term)

The Netherlands and Sweden can be categorised in the column of Germany, and Belgium in the column of France. Differences in corporate ownership create different challenges in the various countries (La Porta, Lopez-de-Silanes and Schleifer, 1999). To illuminate such differences, we will focus on an example of failing corporate governance in polar cases: widely held firms versus family controlled firms.

Widely held firms: corporate governance in widely held firms is about alleviating the conflict of interest between dispersed small shareowners and powerful controlling managers (Berle and Means, 1932, Jensen and Meckling 1976). In cases such as Enron, Worldcom, Vivendi, Royal Ahold etc., corporate managers engage in earnings manipulation, accounting irregularities to inflate share price and gain from their equity and option holdings.

Family controlled firms:[15] in terms of corporate governance, issues can arise with the controlling shareholder. Self-dealing, for example, via value transfer as described by Schleifer and Vishny (1997) and Johnson et al. (2000),[16] is observed. The 'Parmalat case', expropriation by the Italian Tanzi family of about USD 3 billion, hiding losses, overstating assets, understating debt, forging bank documents and diverting cash to the family, can be seen as an extreme example. In this case, the controlling shareholder expropriated investors of corporate resources via self-dealing. Agency problems can thus arise not only between shareholder and management but also between controlling and minority shareholders. I will address this issue in more detail in section 2.4.

As mentioned previously, differences in corporate governance create different challenges in the various countries, leading to different regulatory responses and different interactions between

operate a separate remuneration committee to deal with matters related to remuneration of the top-executives within the company.

[15] These firms are typically better managed than widely held ones, reflected by significantly higher Tobin's Q (Anderson and Reeb, 2003).

[16] E.g. transactions with the dominant shareholder at other than arm's-length terms, biased allocation of intangible assets and liabilities, excessive director compensation. Djankov, La Porta, Lopez-de-Silanes and Schleifer (2008) have created an anti-self-dealing index that is a measure of legal protection of minority shareholders against expropriation by corporate insiders.

governance mechanisms. Gillan (2006) presents a broad corporate governance framework and indicates that corporate governance mechanisms indeed interact with one another; as such, executive compensation is *indirectly* affected by the broader governance framework, i.e. external devices such as the capital markets, governance ratings,[17] the market for corporate control,[18] the labour market,[19] product markets, private sources of external overview,[20] the accounting, legal/tax environment,[21] as well as internal devices, such as the board of directors,[22] the capital structure,[23] by-laws and charter provisions,[24] and the internal control systems.[25]

Besides being *indirectly* affected by the broader corporate governance framework, executive compensation is *directly* affected by national and industry corporate governance codes. In the Netherlands, the Dutch Corporate Governance Code was published in 2003 and amended in 2008. Based on an 'apply or explain' principle, listed companies are affected by the principles and best practice provisions that prescribe certain design criteria.[26] Table 2.4 provides an

---

[17] Capital market information and analysis via corporate governance rating agencies, voting recommendations and securities analysts' reports can reduce agency costs by monitoring corporate management. Increased monitoring ceteris paribus reduces the need for variable compensation (a/o Chung and Jo, 1996, Bethel and Gillan, 2002).

[18] The market for corporate control ceteris paribus reduces the need for managerial incentives. As managers compete in the product market, assets (companies) go to the highest value use and thus inefficient managers are disciplined. However, it can also provide a means by which inefficient managers may indulge in empire building (Bittlingmayer, 2000). Weston et al. (2004) provides a general overview on takeovers, restructuring and corporate governance.

[19] Labour markets, in conjunction with reputation/career concerns of managers ceteris paribus, reduce the need for managerial incentives via executive compensation.

[20] The media is a real corporate governance device. It puts pressure on corporate managers to behave in a 'socially acceptable manner' (Dyck and Zingales, 2002). From a different perspective, CEOs who win media awards are compensated more after receiving awards (Malmendier and Tate, 2009).

[21] Laws influence the structure of executive compensation. The 'million dollar cap' (tax law) in the U.S., for example, has resulted in a greater rate of variable to non-variable compensation, since non-variable compensation is only tax deductible up to USD 1,000,000.

[22] An interesting example is provided by Brick et al. (2006). Excess compensation paid to directors seems to be associated with excess CEO compensation. This excess compensation is furthermore associated with firm underperformance. Evidence is consistent with 'mutual back scratching' or cronyism. In general, the trade-off between monitoring and incentives is interesting. Decreased monitoring can be compensated by increased incentives, as observed in practice (Ryan and Wiggens, 2001, Bryan et al. 2006). However, when supervision becomes inadequate this results in a lower pay-for-performance sensitivity, as incentives would provide an incentive to inflate performance given the low detection possibility. Goldman and Slezak (2006) show that incentive compensation works as a 'double-edged sword'.

[23] Capital structure can discipline management and ceteris paribus reduce the need for incentive pay. Debt financing, for example, mitigates the potential agency costs of free cash flow (Grossman and Hart 1982, Jensen 1986, 1993).

[24] This refers to those governance mechanisms that serve as potential barriers for corporate control. These elements might increase the need for incentive compensation as the market for corporate control works less effectively and therefore can only discipline managers who significantly under-perform.

[25] Internal control systems and codes of ethics can discipline managers and could result in a reduced need for incentive compensation.

[26] For example, regarding long-term incentive programmes, the Code (2003) has the following best practice provisions:

overview of corporate governance codes in the European countries researched. The United States is not reflected, as it can be characterised as more rules based, in view of the Sarbanes-Oxley act[27] (2002), for example, and listing requirements such as the NYSE Corporate Governance Rules (2003) approved by the SEC. Institutional investors in some cases publish their own policy on corporate governance standards affecting their investment choices, such as the Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF) for the fifth time in 2007.

Table 2.4: Overview of the main corporate governance codes per country

Country	Code	Comment	Relative country rating (2009)[28]
The Netherlands	The Dutch Corporate Governance Code	Published in 2003 (Tabaksblat Code) replacing 'Corporate Governance in the Netherlands; the Forty Recommendations' (1997) of the Peters Committee. After three monitoring reports (2005, 2006, 2007), the Code was amended in 2008.	2
United Kingdom	Combined Code on Corporate Governance[29]	Published in 1998, overseen by the Financial Reporting Council. Consolidation of Cadbury (1992) Greenbury (1995) and Hampel (1998). Amended in 2000, 2003 and 2006, 2008, and 2010.	1
Germany	German Corporate Governance Code	Published in 2002 (Cromme Code). Amended in 2003, 2005, 2006, and 2007, 2008, 2009, and 2010.	7

II.2.1 Options to acquire shares are a conditional remuneration component, and become unconditional only when the management board members have fulfilled predetermined performance criteria after a period of at least three years from the grant date.
II.2.2 If the company, notwithstanding best practice provision II.2.1, grants unconditional options to the management board members, it shall apply performance criteria when doing so and the options should, in any event, not be exercised in the first three years after they have been granted.
II.2.3 Shares granted to management board members without financial consideration shall be retained for a period of at least five years or at least until the end of the employment, if this period is shorter. The number of shares to be granted shall be dependent on the achievement of clearly quantifiable and challenging targets specified beforehand.
II.2.4 The option exercise price shall not be fixed at a lower level than a verifiable price or a verifiable price average in accordance with the official listing on one or more predetermined days during a period of not more than five trading days prior to and including the day on which the option is granted.
II.2.5 Neither the exercise price nor the other conditions regarding the granted options shall be modified during the term of the options, except in so far as prompted by structural changes relating to the shares or the company in accordance with established market practice.

[27] The Sarbanes-Oxley act is a U.S. federal law, enacted on July 30 2002, in response to a number of major corporate and accounting scandals including those affecting Enron, Tyco International, Adelphia, Peregrine Systems and WorldCom. Named after sponsors Senator Paul Sarbanes (D-MD) and Representative Michael G. Oxley (R-OH), the Act was approved by the House by a vote of 423-3 and by the Senate 99-0. The legislation established new or enhanced standards for all U.S. public company boards, management, and public accounting firms. It does not apply to privately held companies. The Act contains eleven titles, or sections, ranging from additional Corporate Board responsibilities to criminal penalties, and requires the Securities and Exchange Commission (SEC) to implement rulings on requirements to comply with the new law (www.sarbanes-oxley.com).

[28] Country rating based on Heidrick & Struggles (2009).

[29] In November 2006, the Companies Act was enacted, the result of an eight-year preparation to revise the Companies Act of 1985. An important and related change is that executives need to act in line with shareholders' interests, but also take the longer term into account, as well as interests of employees, suppliers, buyers, and the environment.

Country	Code	Comment	Relative country rating (2009)[28]
France	The Corporate Governance of listed corporations	Published in 2003 (replacing the complementary 1995 Vienot I, 1999 Vienot II and 2002 Bouton). Consolidation of these AFEP[30] and MEDEF's[31] reports. Consolidation of 2007 and 20008 AFEP and MEDEF recommendations.	4
Belgium	The Belgian Corporate Governance Code	Published in 2004 (Lippens Code) replacing the 'Dual Code' of 1998 which formed a consolidation of the code issued by the Belgian Banking and Finance Commission and the code issued by the Brussels Share Exchange Amended in 2008, and 2009.	6
Italy	Corporate Governance Code	Published in 1999 (Preda Code), amended in 2002 (il Codice di Autodisciplina delle società quotate rivisitato) and 2006 (Codice di Autodisciplina).	5
Sweden	Swedish Corporate Governance Code[32]	Published in 2004 (Åsbrink Code). Amended in 2010.	3

The slogan 'corporate governance; an ongoing process' could be found in 2008 on the website of the Belgian corporate governance committee (www.corporategovernancecommittee.be). It reflects a broader European practice that corporate governance codes are introduced, after public consultation, and are regularly amended to reflect the updated state of thinking, after public consultation. Monitoring committees' research typically provides a regular update of the level of appliance of the Code's provisions. In the Netherlands, this review is performed on a yearly basis since the introduction of the Code.

Various academic researchers focus on what types of companies are more likely to apply the Code, instead of explaining why they do not follow certain provisions, such as Andres and Theissen (2008) for the German Code. They found that a significant predictor of individual director remuneration disclosure was Tobin's Q in the year after the Code was introduced. The overall proportion of German disclosure remained low and therefore a new law was enacted in 2006, which mandates disclosure unless the shareholder's meeting grants an exemption.

Table 2.5 provides further information on disclosure, and shareholders' direct power on remuneration. The overview is based on the elements chosen by the Commission of the European Communities, following the 2004 recommendations on directors' remuneration to the member states (Commission Recommendations - Official Journal of the European Union, 2004/Commission Staff Working Document, 2007).

[30] Association Française des Entreprises Privées
[31] Mouvement des Entreprises de France (French Business Confederation)
[32] Amended Swedish Companies Act as at 1 January 2006

Table 2.5: Remuneration-related corporate governance context per country (per 2007)

Country	Disclosure on remuneration policy	AGM vote on remuneration policy	Disclosure of remuneration of individual board members/details
The Netherlands	Y (apply or explain)	Y (binding vote based on law)	Y (law)
United Kingdom	Y (apply or explain)	Y (advisory vote based on apply or explain)	Y (apply or explain)
Germany	Y (partly apply or explain)	N	Y (possibility to derogate if the AGM decides this with 75% of votes)
France	Y (law)	Y (however vote relates to the annual report in general)	Y (law)
Belgium	Y (apply or explain)	N	Partly (only CEO and non-executive directors)
Italy	N	N	Y (law)
Sweden	Y (law)	Y (law)	Y (law)
United States	Y (SEC)	Y (advisory, typically on Summary Compensation Table and narrative)	Y (SEC)

Subsequent developments until 2010 show that that all countries have moved to shareholder voting on remuneration (either the policy or the remuneration report). This is typically an advisory vote. Only the Netherlands and Sweden have a binding vote. Following the start of the financial crisis late 2008, additional local and European guidelines have been introduced for financial institutions. For an overview, please refer to Ferrarini and Ungureanu (2010).

It is not our intention here to conduct another comparative corporate governance study, but merely to state that local regulatory and public policy issues, as well as other elements, such as national culture, vary from one country to the next and, furthermore, must be constantly reviewed in the light of changing local laws and regulations.

The remuneration policies for top executives, especially the CEO, which emerge under these circumstances, are reflected in the next two subsections. The reference year is 2006. By focusing on *policy* levels and structure, a robust overview is obtained for approximately two to four years around the reference year.[33]

2.2.2 Remuneration level

This subsection focuses specifically on the underlying anchor points of ex ante or expected remuneration levels. Remuneration levels of top executives within large listed companies are typically anchored to an external reference group, the peer group. Both the character and the

[33] This statement is based on the notion that remuneration polices are typically altered once every two to four years.

size of this group are therefore important drivers of compensation levels. Do companies specifically look at organisations in the same industry or cross sector, nationally or internationally? A small reference group causes year-on-year fluctuations in the market benchmark. A large group might not be an adequate reflection of the specific labour market the company faces. Tables 2.6 and 2.7 provide overviews.

Table 2.6: Constituents of the reference group

This table shows the characteristics of peer groups. The typical number of companies in the reference group is reflected as well as the focus; cross section versus sector specific, or a combination.

Country	Number	Cross sector	Combination	Sector specific
The Netherlands	15 to 25	27%	27%	46%
United Kingdom	15 to 30	70%	n/a	30%
Germany	10 to 30	80%	n/a	20%
France	10 to 30	85%	n/a	15%
Belgium	15 to 25	Predominantly	n/a	Rarely
Italy	6 to 15	70%	n/a	30%
Sweden	5 to 15	80%	n/a	20%
United States	15 to 40	Predominantly	n/a	Rarely

Table 2.7: National versus international character of the reference group

This table shows to what extent companies choose a national versus an international comparator group.

Country	National	International
the Netherlands	8%	92%
United Kingdom	70%	30%
Germany	90%	10%
France	85%	15%
Belgium	Predominantly	Rarely
Italy	35%	65%
Sweden	80%	20%
United States	Predominantly	Rarely

Within the smallest countries, there is a correlation between choosing a sector-specific peer group and focusing on international peers. A sufficient amount of sector-specific peers in the same country is often difficult to find. The Netherlands is an example of a country with an international focus. Typically, U.S. companies are left out of the peer group, given the significant difference in market practice.

Based on the peer group, a benchmark is performed that ranks the companies from lowest to highest pay. In general, companies tend to focus on the median of the peer group for at target or ex ante compensation. In some instances, and especially for variable pay elements, companies deviate from this practice in order to create a more performance-driven package.[34] In particular, the increase in variable pay has driven executive compensation over the last decade. Table 2.8 provides insight into the bonus and long-term incentive grant level development over the ten-year period starting in 1996 for a typical CEO, as defined in the Worldwide Total Remuneration report of Towers Perrin, until 2005/2006 which is indexed at 100.

Table 2.8: Variable pay grant size development – CEO position

This table shows the development of bonus and long-term incentive (LTI) values for a typical CEO, over the decade 1996-2006. All figures are indexed at 2005/2006 figures.

Year of survey:	1996/1997	1998/1999	2001/2002	2003/2004	2005/2006
Target bonus					
The Netherlands	38	44	73	104	100
United Kingdom	67	73	80	100	100
Germany	28	30	52	100	100
France	56	53	67	81	100
Belgium	63	68	63	75	100
Italy	74	86	100	100	100
Sweden	80	80	120	100	100
United States	76	76	110	112	100
Expected LTI value					
The Netherlands	0	43	88	88	100
United Kingdom	60	76	88	100	100
Germany	0	0	60	100	100
France	45	45	52	55	100
Belgium	0	27	87	83	100
Italy	14	22	80	70	100
Sweden	0	0	125	140	100
United States	39	57	94	108	100

Table 2.8 shows that variable pay has increased significantly over the decade reviewed. In particular, long-term incentives (LTI) are a relatively new phenomenon in Europe. In 1996, LTI

[34] Note that the so-called 'pay-ratchet effect' is especially fuelled by those companies that raise the market/peer group ceiling and other companies who compare themselves to these companies. Section 2.3 will further elaborate on this.

grants were prevalent in half of the countries. In the U.S., grant levels grew exponentially during the 1990s (Jensen, Murphy and Wruck, 2004). This was followed by a downturn. Table 2.9 provides an overview of the eventual results of this development for the research group, i.e. target bonus and LTI levels as a percentage of basic pay.[35]

Table 2.9: Variable pay as a percentage of basic pay – CEO position

This table shows variable pay levels, for the CEO position, expressed as a percentage of fixed pay. The yearly policy levels of target bonus, maximum bonus, and expected value of the long-term incentive are reflected at the 25th, 50th (median) and 75th percentile.

	Chief Executive Officer		
	25th percentile	*Median*	*75th percentile*
		The Netherlands	
Target bonus	57%	90%	100%
Maximum bonus	81%	144%	159%
Expected annualised long-term incentive value	42%	62%	126%
		United Kingdom	
Target bonus	76%	100%	126%
Maximum bonus	125%	180%	205%
Expected annualised long-term incentive value	80%	132%	184%
		Germany	
Target bonus	115%	145%	160%
Maximum bonus	200%	280%	320%
Expected annualised long-term incentive value	30%	70%	120%
		France	
Target bonus	80%	100%	150%
Maximum bonus	120%	160%	220%
Expected annualised long-term incentive value	100%	150%	250%
		Belgium	
Target bonus	45%	60%	100%
Maximum bonus	80%	100%	145%
Expected annualised long-term incentive value	25%	50%	85%
		Italy	
Target bonus	38%	64%	88%
Maximum bonus	60%	100%	200%
Expected annualised long-term incentive value	35%	65%	92%

[35] Basic salary figures are not reflected, as the constituents of the various market indices vary in terms of size and are therefore not directly comparable. Target bonus and long-term incentive figures have been provided as a percentage of basic salary to enhance comparability. Long-term incentives are valued based on a standard approach: binomial model for share options, performance discounts based on the assumption of equal probability of various states of the world.

	Chief Executive Officer		
	25th percentile	*Median*	*75th percentile*
		Sweden	
Target bonus	25%	30%	38%
Maximum bonus	50%	55%	75%
Expected annualised long-term incentive value	0%	15%	31%
		United States	
Target bonus	120%	138%	185%
Maximum bonus	240%	276%	370%
Expected annualised long-term incentive value	360%	499%	609%

Table 2.10 provides an overview with similar figures, but now for a typical top-executive board member. In order to obtain a proxy for the extent to which countries exhibit a more collegial structure or a CEO-model, the numbers in table 2.10 are compared to the figures in table 2.9. From this perspective, German firms score highest on the collegial structure with the smallest deviation between CEO and direct report, and French firms score highest on the CEO-model with the largest deviation.

Table 2.10: Variable pay as a percentage of basic pay – 'direct report' of the CEO

This table shows variable pay levels, for the position reporting directly to the CEO, expressed as a percentage of fixed pay. The yearly policy levels of target bonus, maximum bonus, and expected value of the long-term incentive are reflected at the 25th, 50th (median) and 75th percentile.

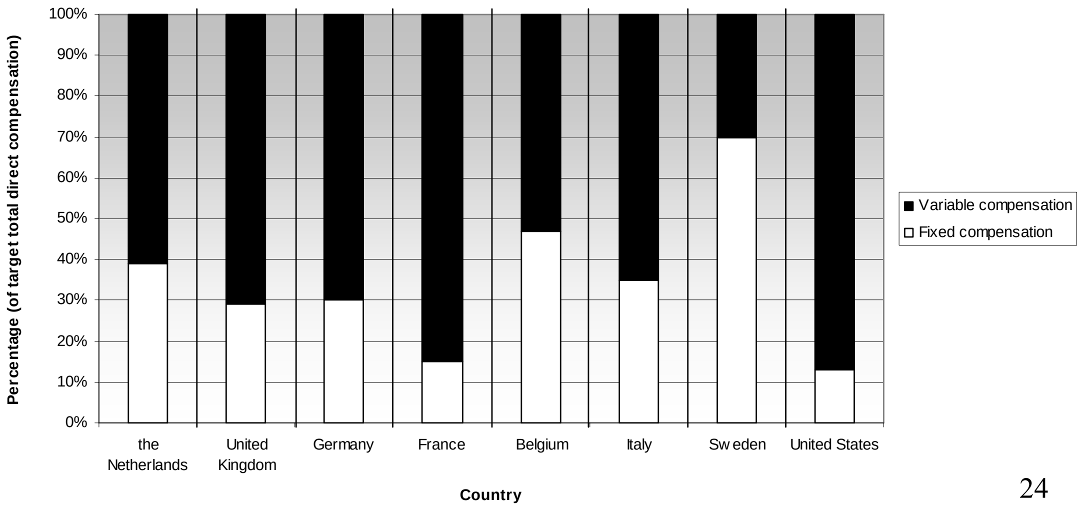
	Direct report of the CEO		
	25th percentile	*Median*	*75th percentile*
		The Netherlands	
Target bonus	53%	61%	80%
Maximum bonus	77%	100%	125%
Expected annualised long-term incentive value	47%	58%	89%
		United Kingdom	
Target bonus	60%	75%	113%
Maximum bonus	100%	150%	164%
Expected annualised long-term incentive value	56%	98%	130%
		Germany	
Target bonus	100%	140%	160%
Maximum bonus	190%	270%	300%
Expected annualised long-term incentive value	30%	70%	125%
		France	
Target bonus	40%	50%	65%

	Direct report of the CEO		
	25th percentile	*Median*	*75th percentile*
Maximum bonus	60%	75%	100%
Expected annualised long-term incentive value	80%	100%	140%
		Belgium	
Target bonus	30%	50%	70%
Maximum bonus	60%	80%	100%
Expected annualised long-term incentive value	20%	30%	70%
		Italy	
Target bonus	28%	40%	50%
Maximum bonus	35%	55%	80%
Expected annualised long-term incentive value	26%	38%	79%
		Sweden	
Target bonus	20%	25%	30%
Maximum bonus	36%	50%	80%
Expected annualised long-term incentive value	0%	10%	26%
		United States	
Target bonus	60%	85%	100%
Maximum bonus	120%	170%	200%
Expected annualised long-term incentive value	180%	256%	347%

In Europe, German firms are known for high bonuses, French firms are characterised by large long-term incentive components as reflected in table 2.9 and 2.10. Swedish bonus and LTI levels are the lowest. U.S. levels are characterised by the significant long-term incentive component, which provides an absolute anchor point at the top of the (global) market.The ratio of fixed (base) pay and total variable pay is reflected in figure 2.1 and 2.2.

Figure 2.1: Mix of fixed versus variable pay– CEO position

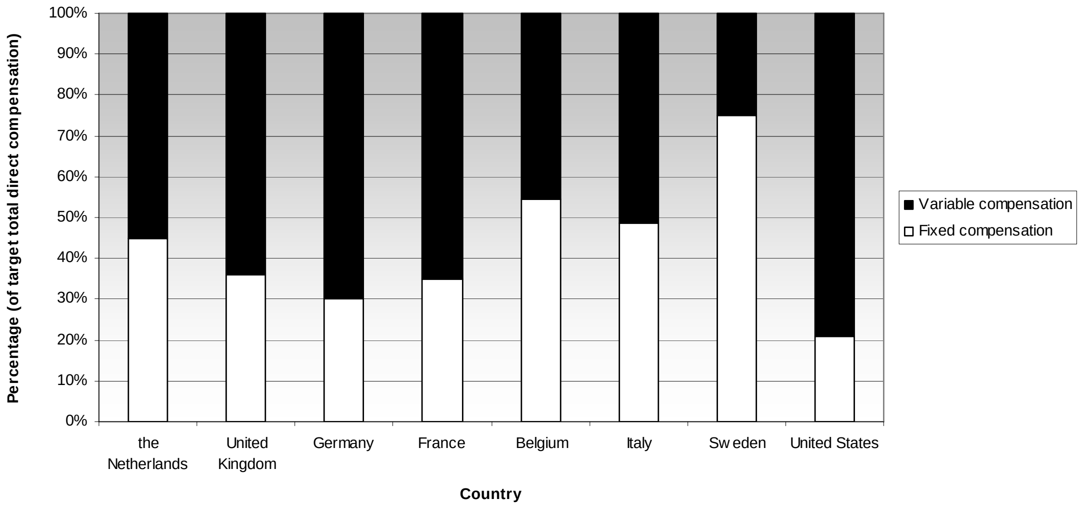
This figure reflects the ratio between fixed and variable pay for the CEO position.



The figures reflect target/policy compensation levels. Whereas Sweden has the lowest variable pay ratio (fixed versus variable pay equals 70:30), the U.S. has the highest performance-related pay mix for the CEO position (13:87). In general, performance-related pay constitutes a larger part of total direct compensation for the CEO than for other top-executives who report to the CEO).

Figure 2.2: Fixed versus variable pay mix – 'direct report' of the CEO

This figure reflects the ratio between fixed and variable pay for the direct report of the CEO.



2.2.3 Remuneration structure

This subsection will provide some insights into the market practice on the remuneration structure, focusing on the variable pay components. Typically, 'pay at risk' is divided into a short-term incentive or annual bonus component and a long-term incentive component, which can be earned over a multi-year period, typically three years or longer.

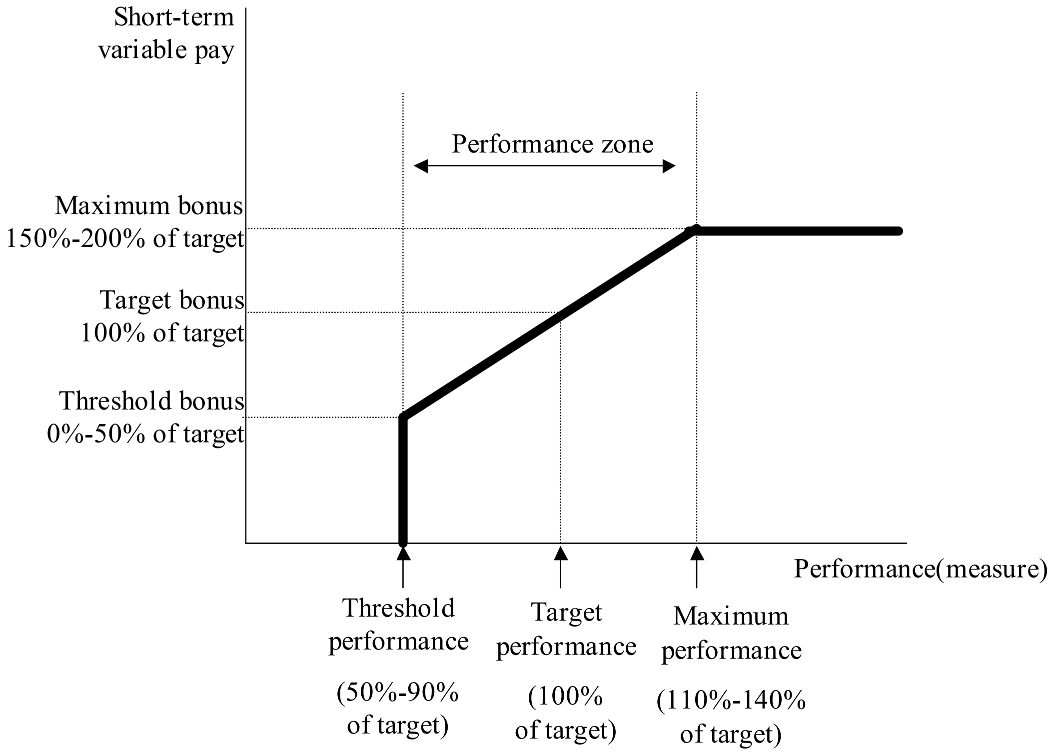
Short-term incentive (STI)

The short-term incentive is earned over the period of one year, based on performance in relation to predefined performance targets. Typically, there is a threshold performance level below which no bonus is awarded. Most companies also define a maximum bonus payout related to a 'maximum performance level'. Even if a higher performance is achieved, the bonus payout is not increased.[36] The performance incentive zone is typically linear between the threshold and maximum performance level. Figure 2.3 shows this.

[36] Maximum bonus levels as a percentage of base pay are reported in tables 2.9 and 2.10.

Figure 2.3: Typical performance incentive zone of a short-term incentive plan

This figure shows the typical performance- and payment zone of a short-term incentive plan. At the threshold performance level, a minimum payment is made. Below this performance level, there is no bonus. The maximum payment under the bonus plan is made if a defined 'maximum performance' level is achieved.

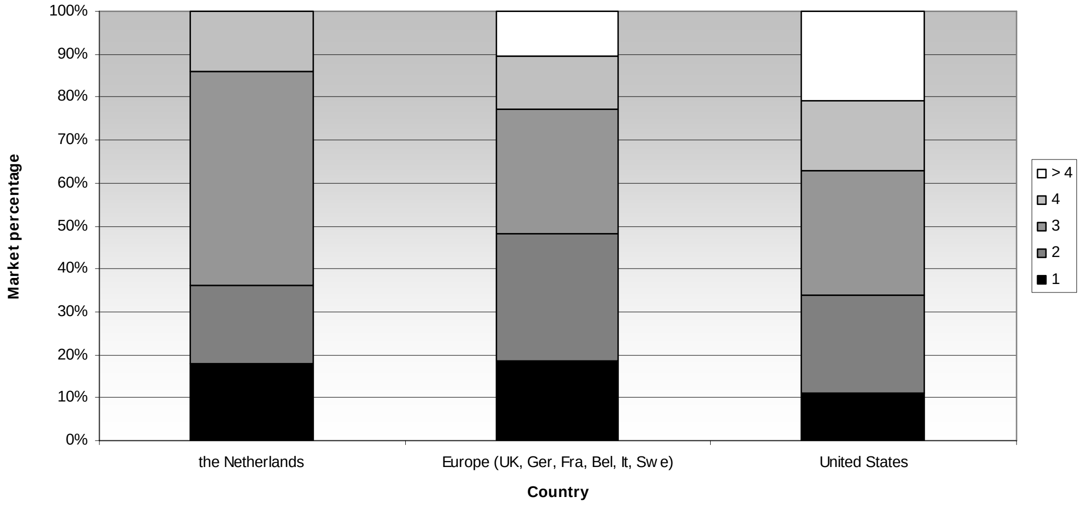


The payment under the annual bonus plan is usually in cash. In Germany, this is the only payment vehicle observed. In the other European countries, a combination of cash and shares is also observed, especially in the UK, whereas, in the U.S., cash payouts are the norm. Approximately 5% of the companies do not pay in cash but in equity.

In the majority of cases, multiple performance measures are used to determine the payout under the annual incentive plan. The largest part of the bonus is based on financial performance measures. Figure 2.4 provides an overview for the Netherlands, the aggregated European market, and the U.S.

Figure 2.4: Number of financial performance measures used (STI)

This figure shows the number of financial performance measures used (1, 2, 3, 4 or more than 4), to measure company performance. The prevalence of use is reflected for the Netherlands, Europe (UK, Germany, France, Belgium, Italy, Sweden) and the U.S.



Most companies use two or three financial measures. Table 2.11 provides the top five of most observed measures. To be precise, the measures reflect categories of measures that companies classify as such.

Table 2.11: Top five of most commonly used financial performance measures (STI)

	the Netherlands	Europe (UK, Ger, Fra, Bel, It, Swe)	United States
1	Operational profit	Operational profit	Sales/Revenue
2	Sales/Revenue	Sales/Revenue	Earnings per share
3	Economic profit (EVA)	Earnings per share	Operational profit
4	Cash flow	Return on invested capital	Net profit
5	Net profit	Net profit	Cash flow

Most of these measures can be classified as accounting and internal (growth) measures, as opposed to value creation or return measures. There are also local customs in the use of performance measures. In the UK as well as Germany, bottom-line profits are the most common criterion to measure performance of top management. However, in Germany, *net profit* is used for this purpose and in the UK *net profit per share*.

In order to establish the bonus payment based on multiple performance criteria, the most commonly used method is the ‘additive method’. This implies that, for each individual performance measure, the bonus payout is determined and subsequently summed to obtain the total bonus. A small number of companies, however, use the alternative 'multiplicative method' in which bonus elements are interrelated. Example: a company with a revenue growth target can choose to modify the associated bonus upwards or downwards based on the outcome on a return measure, to ensure growth is not achieved at the detriment of returns, i.e. profitable growth.

The question as to how performance targets are established is answered in table 2.12.

Table 2.12: Method for establishing performance targets (STI)

This table shows the prevalence of target setting methods for the short-term incentive plan.

	The Netherlands	Europe (UK, Ger, Fra, Bel, It, Swe)	United States
Budget	68%	63%	37%
Year-on-year growth/delta	8%	19%	27%
Management expectations	8%	13%	25%
Relative (reference group)	4%	3%	1%
Timeless standard	12%	1%	1%
Other	0%	2%	9%
Total	100%	100%	100%

The most common method for establishing performance targets is to link these to the annual budget. As the budget is typically somewhat conservative, management expectations might deviate from the budget and therefore it is reflected as a separate category. Relative performance evaluation (RPE) is not often applied to the annual bonus. The 'timeless standard' is neither often used. These timeless standards can be used for return measures, e.g. using the cost of capital as a timeless standard.[37]

As mentioned previously, besides financial measures, most companies use non-financial measures as well when determining the total bonus amount. Examples of non-financial measures are: customer satisfaction, employee engagement, R&D milestones, creating team spirit, et cetera. Table 2.13 provides insight into how many companies use this type of performance measurement, as well as providing an indication of the total bonus that depends on it. If a single market figure would provide a skewed picture, a range is given.

[37] The term 'timeless' should not be taken too literally. Periodically, the level of the standard is evaluated at its merits for the current and expected business situation.

Table 2.13: Prevalence of non-financial performance measures (STI)

This table shows which proportion of the sample uses non-financial performance measures (e.g. customer satisfaction, employee engagement, team synergy) to establish the annual bonus payment. It also shows the typical percentage of the bonus that is governed by such measures.

Country	Percentage of companies	Percentage of bonus
The Netherlands	75%	20%
United Kingdom	89%	35%
Germany	47%	20% - 50%
France	80%	25%
Belgium	90%	25%
Italy	30%	10%
Sweden	65%	10% - 30%
United States	59%	30% - 40%

In some countries, such as Belgium and the UK, the vast majority of companies make use of non-financial measures that determine between 1/4 and 1/3 of the bonus amount. In Italy, non-financial measures are less common and, if applied, typically only make up 10% of the total bonus amount.

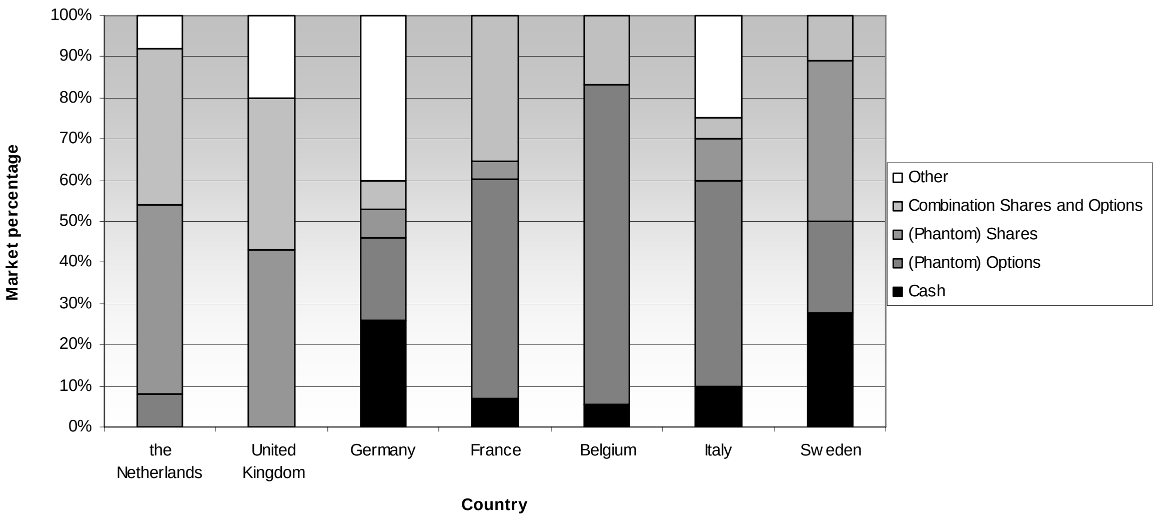
In summary, the short-term incentive consists of several building blocks. Typically, companies use multiple financial performance measures that can differ per organisation. Targets are typically set based on the forward-looking budget, but other methods are also observed. In addition to financial criteria, non-financial performance is measured, criteria varying considerably from company to company, typically determining between 20% and 30% of the total bonus amount. Since 'performance' is multidimensionally formulated within the short-term incentive, empirical research attempting to measure the correlation between pay and performance is faced with an almost impossible task. It is therefore questionable whether adding more studies on this statistical relationship will further broaden or deepen insight into this research area.

Long-term incentive (LTI)

The long-term incentive component can be earned over a multi-year period. The typical payment vehicle across the globe historically used to be share options. In the U.S. during the 1990s, share option grants reached a high in what some academics call a 'share option explosion' (Jensen, Murphy and Wruck, 2004). The vast majority of U.S. companies still grant share options (approximately 75%). The restricted share has become popular over the past years and is granted by approximately 60% of companies in the research year. Performance plans, typically shares or cash with a performance condition, have also emerged as a frequently used remuneration vehicle employed by approximately 50% of companies. For the European countries in the research group, figure 2.5 provides an overview of LTI vehicles.

Figure 2.5: Payment vehicle (LTI)[38]

This figure shows the prevalence of LTI vehicles in each of the countries. The three observed vehicles are shares, options, and cash. Some companies operate a combination of shares and options.



In some countries, LTI design is driven by tax considerations,[39] e.g. Belgian tax-efficient share option plans.[40] Performance conditions, if applicable, can be linked to the grant, i.e. retrospective performance measurement, or to the vesting, i.e. prospective performance measurement, of the LTI (see figure 2.6).

Figure 2.6: Performance condition linked to grant or vesting (LTI)

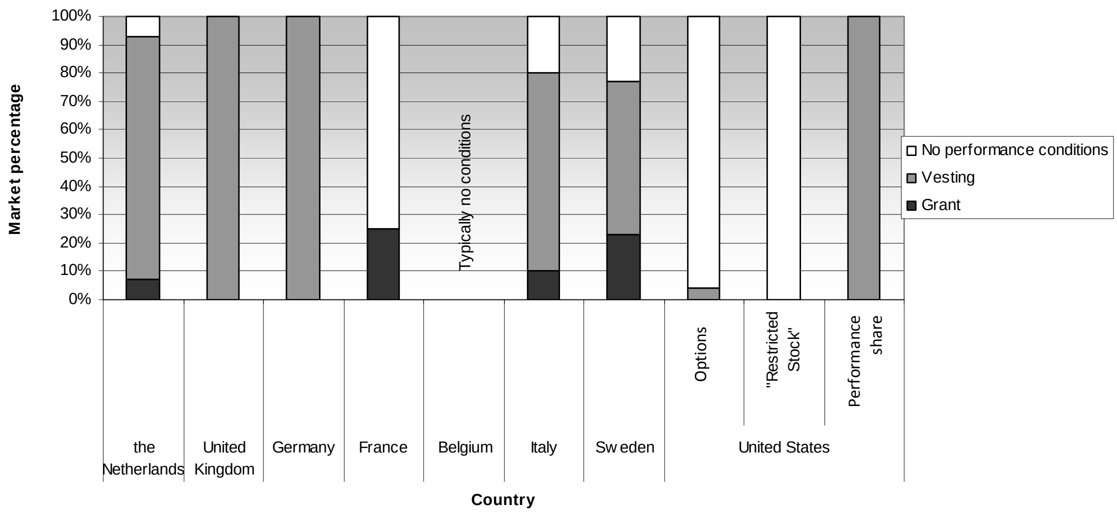
This figure shows the prevalence of the moment in time at which performance is measured within the LTI plan. Measurement at grant implies that the number of shares / options are determined at t=0. Typically a requirement of continued employment over the following three years (t=3) is the only further condition. Measurement at vesting, implies that a number of shares / options are granted at t=0 at the condition of performance testing at a future moment in time. At the moment of vesting, e.g. at t=3, the number of vehicles is ultimately determined. This becomes the unconditional ownership of the participant to the plan.

---

[38] Phantom options are options with which the option holder, 'at exercise', receives the cash difference between the share price and the exercise price. Phantom shares are similar to shares but are settled in cash. In both cases there is no actual transfer of shares.

[39] Source: Equity incentives around the world (2005) – Towers Perrin

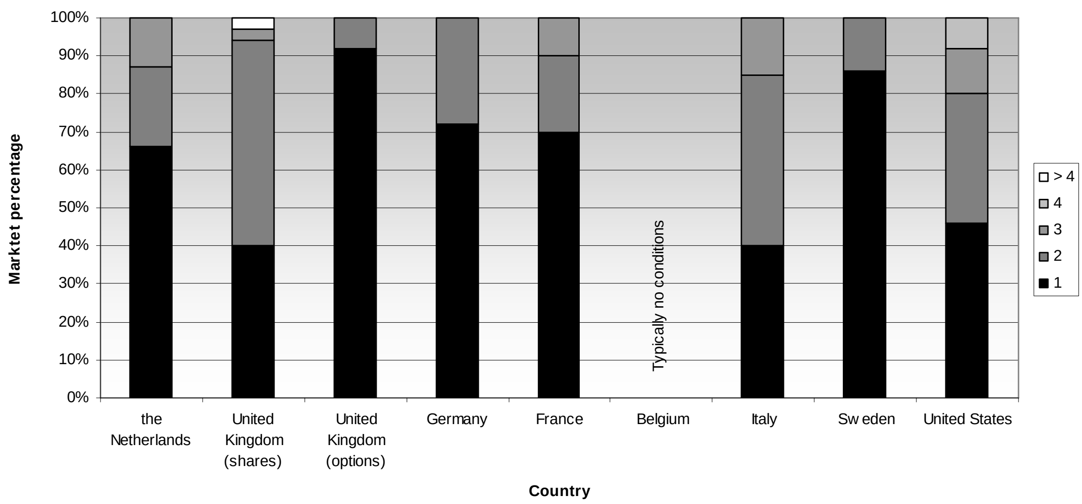
[40] Stock options are taxed on the 60th day following the offer. No further tax is due on the spread at exercise or later on when the shares are sold. This provides for an opportunity to earn a gain that is not taxed (Belgian Law March 26, 1999 and amended by the law of December 24, 2002).



In contrast to the short-term incentive, there are significant differences between countries regarding performance conditions. Even within a single country, the UK, significant differences are observed between options and shares. Therefore, the individual country overview is presented in figure 2.7 (with two bars for the UK).

Figure 2.7: Number of performance conditions (LTI)

This figure shows the number of performance measures used (1, 2, 3, 4 or more than 4), to measure company performance for purposes of LTI vesting.



Most companies use one performance measure linked to the LTI. When two types of LTI vehicles are used, two performance measures become prevalent. Table 2.14 provides an overview of the top two measures in each country. In France, the market practice is more dispersed. Various measures are used with no distinctly numbered 1 and 2 measures, as shown in the table 2.14.

Table 2.14: Top two of most used performance measures (LTI)

This table shows the top 2 of the most prevalent measures, based on which the long-term incentive payment vehicle becomes unconditional (vesting). The UK is reflected twice, given the clear difference in market practice between share plans and option plans.

Country	1	2
The Netherlands	Relative total shareholder return	Earnings per share (EPS)
United Kingdom (shares)	Relative total shareholder return	Earnings per share (EPS)
United Kingdom (options)	Earnings per share (EPS)	Relative total shareholder return
Germany	Share price appreciation (relative and absolute)	Economic and operational profit
France	Total shareholder return (absolute and relative), revenue, operational profit, net profit	
Belgium	Not applicable	Not applicable
Italy	Operational profit	Relative total shareholder return, earnings per share
Sweden	Economic profit (EVA)	Earnings per share
United States	Earnings per share	Absolute total shareholder return

In the Netherlands and the UK, the vast majority of companies use at least the Relative Total Shareholder Return (RTSR) measure, 75% and 93% respectively. In the other countries, the market practice of RTSR is less dominant. RTSR is determined on the basis of relative TSR performance against a defined performance peer group. Earnings per share targets are typically growth based: achieving a certain growth percentage above the development of the consumer price index.

Summarising, companies have increased the use of long-term incentive awards. Apart from plain vanilla share options, other vehicles have been introduced. In particular, the introduction of performance measures to govern vesting[41] of options and shares impacts the risk class of these plans, ceteris paribus. Example: if a company changes the grant of plain vanilla share options to an option plan with a performance measure, this decreases the fair value of one vehicle, measured at the moment of conditional grant. In order to provide the executive with the same initial value, at t = 0, the number of vehicles granted is increased. If and when the performance condition is finally achieved, more vehicles become unconditional than under a plain vanilla plan. This increases the ex post payment realisation in this scenario. However, the probability of a zero payout also increases due to the fact that if the performance hurdle is not achieved no options will become unconditional. This increases the payout variability and thus the level at which these pay components are at risk. A compensation risk index is needed to quantify the magnitude of the changed risk class. This topic is addressed in chapter 3.

[41] 'Vesting' means becoming unconditional. In performance equity plans, share options or shares only become unconditional if and when the defined performance level is achieved.

2.2.4 Summary and conclusion

This section has provided an overview of European market practice on remuneration policies, focusing on the total direct compensation elements. From a bird's-eye view, remuneration policy levels and structure within Europe differ from the U.S. In particular, the remuneration levels and pay mix are not comparable to the U.S. practice. A closer look at the European environment also reveals that country practices differ from one another. Within each country, there are marked differences between companies.

The conclusion of this section is that market practice is diverse. This is caused by differences at the individual, company, industry and country level, which create relatively unique human capital investment combinations. Insight into the (individual) 'executive remuneration decision' is therefore needed, to comprehend more clearly where these differences originate from, such that theoretical anchor points can be linked to the practical context in which these decisions are made. In the next two sections, I will focus on the CEO position and address the underlying dynamics of remuneration levels (see section 2.3), and the remuneration structure (see section 2.4). Subsequently, the role of the remuneration committee is summarised by taking an eclectic perspective, in order to understand the real-life executive remuneration decision (see section 2.5). The chapter ends with a summary and conclusion (see section 2.6).

2.3 Remuneration level: invisible and visible hands in the CEO labour market

This section provides an overview of the fundamental characteristics of the pricing mechanism in the market for CEOs of large companies.[42] The starting point is the theory of human capital (see section 2.3.1) and the intersection between the CEO labour demand and supply curve in the theoretical perfectly competitive market (see section 2.3.2).[43] Significant imperfections mean that these curves can contribute to explaining general market results and movements, but fail to explain individual remuneration packages (see section 2.3.3). In reality, remuneration levels are determined by a bargaining process between the company, which is assumed to be represented by the remuneration committee, and the CEO candidate. This practical context is discussed in section 2.3.4 in which the role of the remuneration committee is examined.

2.3.1 Human capital

The value of human capital is primarily derived from how many the associated qualifications, expertise and skills[44] can earn in the labour market (Ehrenberg and Smith, 1997).[45] Labour is not a homogenous factor of production due to these differences in human capital. Consequently, various labour market segments exist, ultimately based on differences in scarcity, resulting in different compensation levels, e.g. between a factory worker and his CEO. A CEO's ex ante

---

[42] Based on Rosen (1992), the pricing mechanism in the CEO labour market should determine an efficient ex ante and ex post price level for different types of human capital (in the relative and absolute sense).

[43] According to Adam Smith (1776), the price system solves the economic problem efficiently without conscious direction: "Every individual endeavours to employ his capital so that its produce may be of greatest value. He generally neither intends to promote the public interest, nor knows how much he is promoting it. He intends only his own security, only his own gain. And he is led by an *invisible hand* to promote an end which was no part of his intention. By pursuing his own interest he frequently promotes that of society more effectively than when he really intends to promote it".

[44] There are different ways to characterise skills. Following and expanding the work of Becker (1964), Castanias and Helfat (1991) and Harris and Helfat (1997), a four way classification is provided by Castanias and Helfat (2001) and Bailey and Helfat (2003): g*eneric skills*, which can be transferred across all businesses and firms; *related industry skills,* which can be transferred outside of an industry to other industries that make related products or that utilise related resources and production processes; *industry specific skills,* which can only be transferred to firms that operate in the same industry; *firm specific skills,* which cannot be transferred to other firms. When the CEO possesses superior skills, which are short in supply, he can use them to generate rents. Ricardian rents are returns to the CEO in excess of the payment required to attract him to his occupation. Quasi rents are primarily produced by firm-specific skills and are returns in excess of the payment level that would cause the CEO to leave (i.e. value in its first best and next best use).

[45] These types of statements should be viewed in the context of various theories of the firm. One of these theories perceives the firm as '*rent seeking*' (Williamson 1971, 1979, 1985 and Klein, Crawford and Alchian, 1978). The key idea here is that integration is efficient in situations in which non-integration leads to inefficiency. Other theories of the firm are for example '*property rights*' theory and '*incentive system'* theory. Within *property rights* theory, efficient bargaining causes the parties to share the surplus from their specific investments; a/o Grossman and Hart (1986), Hart and Moore (1990) and Hart (1995). The '*incentive system*' theory focuses on an incentive problem between a principal and agent, asset allocation, incentive contracting etc.; a/o Holmstrom and Milgrom (1991, 1994), Holmstrom and Tirole (1991) and Holmstrom (1999).

compensation is thus the price that is paid by the company for scarce human capital.[46] The eventual price that needs to be paid depends not only on past investments, education, acquired skills and expertise, but also on the nature of the future investment. The risk associated with the job will result in a risk premium being required. The higher the risk, the higher the premium that needs to be paid to ensure the individual is willing to invest in the relationship.[47] Inequality, even in perfectly competitive markets, therefore results from past investments as well as the magnitude and risk of the new investment.

2.3.2 Demand and supply in the CEO labour market

CEO labour demand

The demand side of the market for CEOs consists of firms that seek to hire a new CEO from inside or outside the firm at a given moment in time. The elasticity of labour demand equals the responsiveness of labour demand to a change in wage rate.[48] In order to generally assess the elasticity of the CEO labour demand curve, table 2.15 provides two determinants supplemented with comments relating to the CEO labour market. It indicates that the CEO labour demand curve is relatively inelastic as the result of no direct substitution possibilities and a relatively low direct impact from the elasticity of the goods it produces.

Table 2.15 Elasticity of CEO labour demand curve

This table describes the (relative absence of the) substitution effect and the scale effect, in light of the CEO labour demand curve.

Substitution effect by using less labour and more of other means of production	The CEO is at the top of the company 'pyramid' and cannot directly be substituted by, for example, assets, such as factory workers by machines (to a certain extent).[49]

[46] Human capital refers to the qualifications, skills and expertise that contribute to a worker's productivity. Pioneering articles in human capital theory are Schultz (1960) and Becker (1962). Mincer (1970) provides a survey of the early human capital studies.

[47] Some further notes on human capital investments and associated risk: CEOs of listed companies typically face a higher risk than CEOs of non-listed companies due to increased visibility, e.g. increased risk of reputation damage. CEOs of companies that face financial distress, or a high risk of it, incur greater risk than companies in a state of going concern/lower risk of financial distress. The frequently recorded pay difference between a CEO hired from within or from outside of the company can also be related to investment risk. The magnitude and risk of the investment for the first is lower than for the latter, as the 'insider' has already made firm-specific investments in the past and has more knowledge of potential returns. Generally speaking, in recent years, as a result of increased transparency and required accountability, e.g. Sarbanes Oxley, introduction of corporate governance codes, etc., the risk of the top executive position investment has increased. This is accompanied by increased remuneration levels.

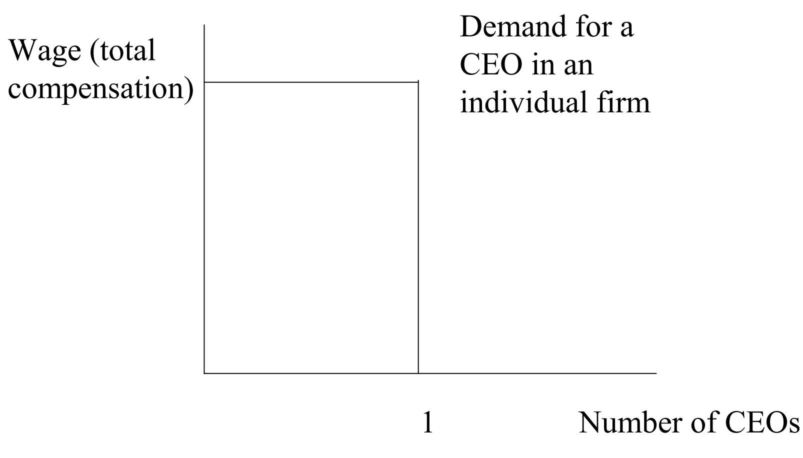
[48] Hicks (1966) and Marshall (1923) provide the Hicks-Marshall laws of derived demand, which assert that the elasticity of demand for a category of labour is higher when the price elasticity of demand for the product it produces is higher, when other factors of production can easily be substituted for the category of labour, when the supply of other factors of production is more elastic, and when the cost of employing the category of labour is a large share of the total cost of production.

[49] A CEO can only be substituted by another CEO. In some cases this is a value-enhancing decision. For the Dutch market, Cools and Van Praag (2007) have researched the value relevance of unanticipated top executive departures and found that forced departures, by the Supervisory Board, are indeed value

Scale effect/price elasticity of demand for the goods that labour produces	Generally speaking, as labour is a derived demand, the price elasticity of labour depends on the price elasticity of the goods that are produced. When the price of labour increases, the costs to produce the product, increases as well. The increase is passed on in the form of a higher product price. If the demand for the good is elastic, fewer quantities will be asked for and therefore less labour is needed. The price elasticity across industries can differ as a result of the different products that are produced, e.g. basic versus luxury items. However, in the case of the CEO position, two additional elements determine price elasticity: i) Total CEO labour costs are typically only a small fraction of the total costs (revenues) of the company and therefore the derived demand for CEO labour is significantly less elastic;[50] ii) The CEO position is a unique position and the demand in a single firm cannot be reduced. The demand for all CEOs in the total market, or a certain industry, and in the longer term, is more elastic as the market for corporate control can reduce the total number of CEO positions, as a result of mergers and acquisitions, in a certain industry or economy.

Figure 2.8 reflects a drawing of the CEO demand curve for an individual company that is searching for a CEO. It is perfectly inelastic up to a certain 'cut off' point. Theoretically, this would be the point at which the market for corporate control takes over; i.e. where it is more efficient to have one CEO run a merger of two businesses.

Figure 2.8: CEO demand curve



relevant, defined in terms of positive abnormal share price returns subsequent to the announcement, researching the period 1991-2000.

[50] When, for example, a sample is taken from approximately the 50 largest companies in the Netherlands for the year 2005, total direct CEO compensation (basic salary, bonus, annualised long-term incentive) equals 0.07% of total sales with a standard deviation of 0.09% (source: Towers Perrin Dutch Top Executive Remuneration Survey 2005).

Since the CEO labour demand curve for an individual company will be perfectly inelastic over a large range, the demand side of the market does not provide an instant cap on CEO pay. As a result, the labour demand curve for the whole market is also highly inelastic. It is basically obtained by a horizontal summation of the individual CEO labour demand curves.[51] In light of the above, the perception of the labour *supply* curve is important in achieving an efficient wage level in the market for CEO human capital, as the labour demand curve only provides for a very high natural cap.

CEO labour supply

The supply side of the market consists of CEO candidates. All internal and most external candidates do not hold the position of CEO in their current firm. Resulting from the specific skills needed, i.e. scarcity, the number of qualified CEO candidates is small. Khurana (2002a, b) provides case examples comparing the initial pool of candidates for a CEO position and a Marketing Vice President position. The initial pool of a Marketing VP was ten times the size of the initial pool of CEO candidates. Of course, this is related to relative scarcity. However, Khurana (2002a, b) also indicates that the scarcity is exacerbated, if not actually created, by the participants themselves. The shortage might essentially be a misperception, largely driven by the fact that boards employ extremely limited criteria to define the pool of eligible candidates. Labour supply is also small as a result of the fact that not all qualified sellers are always aware or made aware of the CEO vacancy. The elasticity of labour supply equals the responsiveness of labour supply to a change in wage rate. In order to generally assess the elasticity of the CEO labour supply curve, table 2.16 provides two determinants supplemented with comments relating to the CEO labour market.

Table 2.16 Elasticity of CEO labour supply curve

This table describes the effect of occupational and geographical mobility on the CEO labour supply curve.

Occupational mobility	The elasticity of the CEO labour supply curve depends partially on the occupational mobility, i.e. the ability and willingness to do the job, as well as the awareness of possible candidates that the job is available.
Geographical mobility	To what extent CEO candidates are mobile is difficult to assess. Generally speaking, if the mobility is higher, the elasticity of labour supply is higher. When taking the international context into account, one might argue that CEO candidates are still relatively immobile, given the fact that large pay differentials between different countries continue to exist, indicating no global market place.[52]

[51] Note that this is particularly true for the short term. Over the longer term, the market demand curve will be somewhat more elastic than a horizontal summation of long-term individual firm demand, as a result of the fact that the long-term curve must take into account the impact of the entry and exits of firms.

[52] Pay differences are recorded, among others, in Conyon and Murphy (2000).

A change in the wage rate results in an income effect and a substitution effect (Jacobsen and Skillman, 2004). The eventual effect of a wage increase is the result of these effects. On the one hand, an increase in the wage rate increases the price of leisure and therefore increases the number of working hours. The change in the quantity of work/effort supplied corresponding to this element is termed the *substitution* effect. It has a positive sign, as the hours of work increase when the wage goes up. On the other hand, the increase in real income results in more leisure (fewer working hours). This is called the *income* effect. Therefore the income effect has a negative sign: if income goes up, hours of work fall. If the substitution effect dominates, the person's labour supply curve will be positively sloped. If the income effect is dominant, the person will respond to a wage increase by decreasing his or her labour supply.

It is likely that elasticity is positive for a large part of the supply curve. Increase in compensation, results in a higher number of individuals that will invest in breaking the occupational barrier and, furthermore, there will be more geographical mobility towards the higher wage. Higher compensation could eventually also result in increased inelasticity, possibly even bending the curve backwards when individuals in this segment become financially independent relatively quickly and could exit the market. The difficulty of drawing the CEO labour supply curve is related to the fact that, within the CEO labour market segment, further segmentation would be needed from identifying similar types of jobs.[53] Having the skill set to be the CEO of a small privately-owned company does not imply being qualified to lead a large listed company. The associated pay difference of hundreds of thousands of euro emphasises this point.[54] It is not my further objective here to establish homogenous jobs. Following Himmelberg and Hubbard (2000), it is concluded that the supply of highly-skilled CEOs capable of running large complex corporations is relatively inelastic.[55] The supply of CEOs capable to run smaller businesses is relatively less inelastic, due to relatively less scarcity.

General market forces underlying CEO pay increases – shifting demand and supply

There is a consensus that CEO compensation has increased significantly over the past decade (Jensen et al. 2004, Bebchuk and Grinstein, 2005). Possible market-based explanations of changes in CEO pay levels can be found in shifting demand and supply curves. A summary is provided below of how these shifts can result in changed or increased compensation:

---

[53] The imperfections in this market furthermore show that there is no 'going rate' where CEO compensation is concerned. Bargaining is an important characteristic of this market. Imperfections are addressed in section 2.3.3.

[54] Towers Perrin Top Executive Remuneration Survey (2008)

[55] When supply is inelastic, a larger part of the rents to be divided between company and CEO is captured by the CEO.

Shifts in the CEO labour demand curve:

i) Within a certain industry, when the demand for the final product increases, ceteris paribus the price of the product will increase and will raise the marginal revenue product of labour, shifting the demand curve to the right, causing an increase in compensation;

ii) When the human capital needed to do the job changes and/or when productivity of labour increases, the labour demand curve shifts.[56] Rosen (1992) has shown that for CEOs, marginal productivity[57] is important as "the activities of the CEO are magnified geometrically, because they affect recursively the productivity of all who work below them in the organisation". The marginal product of talent and skills is thus larger at higher levels of a hierarchy, through a chain letter effect, i.e. a little extra talent at the top can have enormous effects on total output/value creation. This 'scale of operations' effect accrues to the managers as rents;[58]

---

[56] A change in human capital needed to perform the job as an explanation for the pronounced trend of outside hiring and increased CEO pay levels, has been explored by Murphy and Zábojník (2007). Basically, their line of reasoning boils down to a change in the composition of managerial skills needed to manage a modern corporation. The relative importance of general skills, financial and accounting expertise, and ability to manage physical and human assets, has increased relative to firm-specific skills, knowledge, contacts, and experience only relevant within the organisation. Based on the assumption that transferable ability is 'priced' in the managerial labour market and firm-specific capital is 'unpriced', the authors explain the significant increase in executive compensation in the United States between 1970 and 2000, as being due to the increased importance of general managerial skills in the modern organisation.

[57] For the labour market, marginal productivity theory indicates that competitive, profit-maximising firms hire each factor, including labour, up to the point at which the value of the marginal revenue product of the factor equals its price: marginal cost of labour = marginal revenue product of labour. The marginal cost equals the market or equilibrium wage. The marginal revenue product equals the multiplication of the marginal physical product of labour (MPPL), the extra output produced by the last worker, and the marginal revenue gained by selling one more unit of output (MR). For a CEO position, this notion is particularly relevant in a relative sense and is typically defined in terms of value creation. If another CEO, with more talent, would increase the value of the company more, based on marginal productivity theory, such a CEO would be paid more.

[58] This is much like the 'superstar' effect as described by Rosen (1981). As a result of a convexity of R(q), which is the net revenue as a function of talent, small differences in talent become magnified in larger earnings differences, with greater magnification if the earnings-talent gradient increases sharply near the top of the scale. In the case of 'superstars', every consumer wants to enjoy the goods that are produced by the best producer. The producer is able to supply every consumer at low cost. This enables talented people to command both very large markets and very large incomes. Gabaix and Landier (2008) use extreme value theory to study the economics of superstars. They obtain general functional forms for the distribution of top talents and find that the dispersion of CEO talent distribution appears to be very small at the top. They research 250 U.S. firms. If CEOs are ranked by talent, and the CEO number 250 is replaced by the CEO number one, the value of the firm will increase only by 0.016%. These very small differences in talent, translate into considerable compensation differentials, as they are magnified by firm size. Indeed, the same calibration delivers that CEO number 1 is paid over 500% more than CEO number 250. With regard to the six-fold increase of CEO pay between 1980 and 2003, they show that a reasonable explanation is the six-fold increase in market capitalisation of large U.S. companies during that period. When stock market valuations increase by 500%, under constant returns to scale, CEO 'productivity' increases by 500% and equilibrium CEO pay increases by 500%.

iii) The supply of other factors of production is less relevant for the CEO labour market segment. Substitutes are not available and supplements do not necessarily have an impact at the top level.

Shifts in the CEO labour supply curve:

i) Fundamental changes in tastes: one could argue that, as a result of the emancipation of women, more qualified sellers enter the market in addition to the existing male candidates, and the CEO labour supply curve shifts to the right. This possible effect will therefore not result in a higher equilibrium compensation level, but rather the opposite, as a result of a higher supply;

ii) Changes in alternative opportunities: the supply of labour in any one labour market depends on the opportunities available in other labour markets. If wages are increased in other markets, workers will shift jobs if they are willing and able to do so. This causes the labour supply to decrease in the first market mentioned. Example: the supply of CEOs for the submarket of publicly listed companies can be affected by increased prevalence of the private-equity sector. The 'Calhoun case'[59] in 2006 seemed to suggest an increase in alternative opportunities. These types of change can result in an upward pressure on CEO compensation levels within the segment of listed companies, to attract and retain the best-qualified candidates;

iii) Cross country movements: movements of workers from region to region, or country to country, usually result in shifts in the labour supply curve. The CEO labour market has a clear international dimension. In this respect, it is interesting to note that allowing foreign candidates to apply for the job, widens the pool of potential candidates, but could in fact drive pay upwards. When, for example, a Dutch firm wants to hire a CEO from the U.S., it needs to pay a compensation level above the local market level, due to the pay differential between these countries, besides the additional transaction costs that are associated with hiring someone from abroad;

iv) The non-pecuniary aspect of the job and reputation risk: an increase in reputation and other risks will diminish the number of candidates that are willing to do the job at a certain compensation level; increased legal and corporate governance regulations, increased media attention, public scrutiny, et cetera, result in an increase of the market equilibrium wage (see case study 2.1).

[59] David Calhoun left General Electric, a large listed company, to become the CEO of a significantly smaller privately held Dutch based firm, VNU/The Nielsen Company (The Wall Street Journal, August 24, 2006).

Case study 2.1: pay increases as a result of increased reputation and other risks

An extension of the risk of reputation damage is the public debate on management compensation. At the end of the last century, Prime Minister Kok scrutinised the level of compensation of Management Board members in the Netherlands. Since then, there is a yearly public debate about it (Engesaeth, 2006). The debate typically calls for moderation. However, from the perspective of the CEO it increases the risk of reputation damage. This could affect the CEO labour supply curve; because fewer individuals are willing to apply for a CEO position at a given compensation level. In this light, the media play an important role as they provide information that is used by decision makers in modern economies and societies. Whether the information is independent and correct, relates to the question of "who owns the media" as researched by Djankov et al, (2003). Below, I provide an example of bringing inadequate information into the public domain, which can exacerbate the previously described situation of risk for executives. *Het Financieele Dagblad,* the Dutch equivalent of the Wall Street Journal or Financial Times, dated May 29th 2006, headlined the morning paper with an article stating that basic salary levels of CEOs had risen strongly from the year 2004 to 2005. The CEOs of the AEX companies received a salary increase of more than 30%, according to the paper. These figures were taken from the public website www.bestuursvoorzitter.nl of the *Vereniging voor Effectenbezitters* (VEB – securities holders' association), which represents and defends the interests of small investors. I have downloaded this dataset to take a closer look at it; see table 2.17.

Table 2.17: Overview of changes in fixed compensation

This table shows an overview of fixed compensation per 2004 and 2005 of the CEOs of the AEX listed companies in the Netherlands. Increases from the year 2004 to 2005 are reflected in the final column. Source: VEB website www.bestuursvoorzitter.nl

	CEO (company)	2005	2004	increase %
1	Bakker (TNT)	900,000	900,000	0.0%
2	Bennink (Numico)	1,000,000	1,000,000	0.0%
3	Cescau (Unilever)	1,336,000*	1,109,000	20.5%
4	Davis (Reed Elsevier)	1,507,246	1,457,836	3.4%
5	De Becker (Hagemeyer)	654,355	650,000*	0.7%
6	Elverding (DSM)	612,000	599,760	2.0%
7	Goddijn (TomTom)	186,319*	127,582	46.0%
8	Groenink (ABN Amro)	910,000	889,000	2.4%
9	Hulshoff (Rodamco Europe)	397,000	371,000	7.0%
10	Keller (SBM Offshore)	574,000	404,000*	42.1%
11	Kleisterlee (Philips)	1,020,000	1,015,000	0.5%

12	Koffrie (Buhrmann)	567,000	561,000	1.1%
13	McKinstry (Wolters Kluwer)	846,000	772,000	9.6%
14	Meurice (ASML)	630,000	150,000*	**320.0%**
15	Miles (Vedior)	601,000	582,000*	3.3%
16	Moberg (Ahold)	1,500,000	1,500,000	0.0%
17	Ruys (Heineken)	634,000**	543,000	16.8%
18	Scheepbouwer (KPN)	1,001,397	1,003,236	-0.2%
19	Shepard (Aegon)	803,000	804,000	-0.1%
20	Tilmant (ING Groep)	1,289,000	1,250,000*	3.1%
21	Van Boxmeer (Heineken)	472,000*	358,000	31.8%
22	Van den Bergh (VNU)	661,725	622,594	6.3%
23	Van der Veer (Royal Dutch Shell)	1,525,000	1,281,774	19.0%
24	Votron (Fortis)	750,000	187,500*	**300.0%**
25	Wagenaar (Getronics)	625,000	600,000	4.2%
	Average			**33.6%**

* Appointed CEO per the indicated year ** Stepped down as CEO per the indicated year

Table 2.17 does indeed show that the average increase of basic pay was 33.6%. However, it also shows that this number is heavily affected by various inaccurate comparisons. The most obvious examples are the increases of around 300% of Mr. Meurice (ASML) and Mr. Votron (Fortis), who joined their companies on 1 October 2004 and 11 October 2004 respectively. The calculation thus compares approximately three-month salary in 2004 with a full year's salary in 2005. When these figures are left out of the comparison, the average drops significantly to a 9.8% increase, which still incorporates a number of similar flaws, such as Mr. Keller of SBM, who joined the company on 9 August 2004, and Mr. Goddijn of TomTom, who became CEO of the company on 27 May 2005. This example shows that, in the process of translating data to information, the media can add noise to the public domain.[60] This increases the reputation risk for top executives and can cause upward pressure on compensation. Another example of reputation risk is provided by the introduction of the Sarbanes Oxley act (2002). This act requires the Chief Financial Officer of the company to sign the financial statements of the company together with the CEO. The consequence of providing wrong information to the public can be imprisonment in the U.S. This caused upward pressure on the compensation of CFOs for Dutch companies with a listing in the United States.

End of case study 2.1

---

[60] The article, to some extent, also reveals what is news and what not. The flawed dataset in figure 2.18 shows a median increase of 3.4%. One of the alternative angles that the article could have taken is the fact that half of the AEX companies had an increase of 3.4% or less.

Concluding

Theoretically, shifts in demand and supply curves can provide a market-driven explanation for changes in CEO compensation. It was concluded that the labour supply and demand curves are inelastic, especially for individuals who are able to manage the largest corporations in our society. Therefore, small shifts in these curves can cause significant changes in the 'equilibrium price'. Although shifts in market demand and supply curves can explain general market movements to a certain extent, they fail to explain individual compensation packages. The CEO labour market is less competitive than is basically assumed in this section; in fact there is no single equilibrium price. Gomez-Meija and Wiseman (1997), for example, observe huge variations in the salary, bonuses and long-term incentive income received by executives of firms of similar size, in the same industry, and given similar performance. Significant market imperfections in the CEO labour market are an important cause of these differences and are discussed in the next section.

2.3.3 Imperfections in the CEO labour market

This section abandons the theoretical assumption of the perfectly competitive market of the previous section. It describes market imperfections that exist in practice, as well as possible ways to diminish these imperfections.

CEO labour market segment benchmark

In order to provide an additional characterisation of the 'pricing mechanism' within the CEO labour market, we discuss the market imperfections below. As it is difficult to specify the size of the economic imperfections of the CEO labour market in absolute terms accurately, we characterise it in relative terms. Hence, we compare the CEO labour market with two other segments of factor markets: i) *Share market*: the general working and efficiency of financial markets is well known and widely researched. Share markets, typically central exchanges, can be considered highly competitive; there is a broad consensus that the share market works relatively efficiently; ii) *Labour market for manufacturing employees*: part of the differences of comparing a financial market segment with a labour market segment is attributable to the fact that two different factors of production are compared; labour versus capital. As human beings are less homogenous and less mobile than money, labour markets generally exhibit larger imperfections than financial markets. In order to illustrate that, relative to other labour market segments, the CEO labour segment has its own dynamics, we also compare it to the market for manufacturing employees in table 2.18.

Table 2.18: Relative imperfections in the CEO labour market

This table shows the characteristics of the perfectly competitive market, and indicates to what extent the elements are applicable to the CEO labour market segment, the share market, and the labour market segment for manufacturing employees.

Characteristics of the perfectly competitive market	CEO labour market segment	Share Market	Labour market segment for manufacturing employees
Large number of buyers and sellers	*Not applicable* Relatively small number of buyers and sellers	*Applicable*	*Applicable*
Everyone is a price taker:	*Not applicable* This is not the case in the CEO market. In reality, matching and negotiation costs give rise to a bargaining process. The CEO candidate may have a powerful position to raise initial compensation. Anecdotal evidence also suggests that the list of possible candidates is relatively small as a result of limited criteria applied by companies.[61] Furthermore, prices/compensation levels are referenced to a limited number of peer companies (Khurana, 2002b).	*Applicable* This is more or less the case in the share market; only large bulk shareholders may be able to influence the price.	*To a certain extent applicable* Individual factory workers as well as the companies offering factory jobs are more or less price takers. Only indirectly, via unions, do factory workers have bargaining power.
Freedom of entry:	*Not applicable* It is difficult to enter the CEO labour market, especially in the short term, as a result of barriers relating to education, experience, etc. Transaction costs are also high: costs of sign-on bonuses and or exit arrangements.	*Applicable* Large freedom of entry. Transaction costs are low.	*To a certain extent applicable* The labour market for factory workers can be relatively easily entered. Transaction costs are relatively low.
There is perfect knowledge:	*Not applicable* There is imperfect knowledge. The market is not very transparent. There is no central marketplace. Information is costly; Supply side: not everyone is aware of the fact that a CEO position will be filled; process is often shrouded in secrecy; Demand side: skills, compensation, etc., of candidates are often not known and information is also noisy.	*Applicable* The knowledge level in the market is high. Most research indicates that the share market is efficient in, at least, the semi-strong form. Information is revealed through the pricing mechanism.[62]	*Not applicable* There is no perfect knowledge. Not every worker is completely aware of all jobs (there is no central market place).
Factors are homogenous	*Not applicable*	*Applicable*	*To a certain extent applicable*

[61] According to Khurana (2002a and 2002b), this is further narrowed down when decisions are made to invite candidates for an interview.

[62] Grossman and Stiglitz (1980) indicate that when information is costly, a perfect competitive equilibrium does not exist to completely transmit the informed trader's information to uninformed traders. Markets can therefore not be fully open for arbitrage when information about the arbitrage opportunity is costly.

Characteristics of the perfectly competitive market	CEO labour market segment	Share Market	Labour market segment for manufacturing employees
	In the CEO market as a whole, factors are not homogenous; there is a difference in ability, skills, charisma, etc. Only if this market is segmented further, it might be the case that factors are homogenous to a certain extent in each segment.	Yes, factors from a certain risk type are homogenous.	Although there will be some differences between different manufacturing employees in terms of skills and motivation, generally speaking the factors to a large degree are homogenous.
Market is in equilibrium. Price system is informative and results in Pareto optimal results/allocation.	Price is not very informative as a result of: Imperfect information (characterised by private information and noise);[63] Transaction costs are high; Labour immobility; The impossibility of arbitraging further prevents first best efficient results.	Price is informative. Results are relatively close to perfectly competitive. Efficient market model, apart from a number of anomalies, is a good approximation of reality.	Price is relatively informative. Imperfections arise a/o from: Collective bargaining agreements; Labour immobility.

Table 2.18 shows that the CEO labour market segment is far from perfectly competitive and displays large discrepancies resulting from operational and informational inefficiency: i) *Operational efficiency:*[64] the CEO labour market has the lowest operational efficiency. Transaction costs are high, as a result of sign-on bonuses, severance arrangements, etc. The bid-ask spread is higher than in the other markets described. To explain this statement: in a not perfectly competitive market there are two prices: the bid price and the ask price. The narrower the bid-ask spread, the more competitive the market, apart from other transaction costs, which also need to be low. The share market can be called highly competitive, for example, as the bid-ask spread is very low.[65] The imperfections in the CEO labour market cause a high bid-ask spread. In the CEO labour market, the company determines the bid price and the CEO candidate the asking price. Based on contract negotiations, the eventual price for human capital is

[63] Grossman and Stiglitz (1980) indicate: the more individuals are informed, the more informative is the price system. In general, the price system becomes more informative if the quality of the informed trader's information increases. The greater the magnitude of noise, the less informative the price system is.

[64] A market is called operationally efficient if trades are made at the lowest possible cost, i.e. if transaction costs are minimal. Transaction costs include commission paid to brokers or intermediaries as well as the prevailing bid-ask spread: the difference between the price at which someone is willing to buy and at which someone is willing to sell (offer price). In the share market, for example, transaction costs are minimal as a result of active competition in the market and among brokers.

[65] What constitutes a small bid-ask spread is somewhat arbitrary; a spread of less than 1% may be considered small, but a spread of 5% or more certainly not (Houthakker and Williamson, 1996).

determined at which the transaction occurs. Whether the eventual price will be closer to the bid or to the ask price is primarily dependent on the bargaining power of both parties; ii) *Informational efficiency:*[66] as the operational efficiency of the CEO labour market is the lowest, it will also have the lowest informational efficiency. The market is characterised by a great deal of 'noise'; for example, uncertainty about the quality and number of qualified CEO candidates.

The significant imperfections in the CEO labour market give rise to results that are not necessarily competitive. Some guidance on reducing market imperfections is provided below.

Reducing market imperfections

Due to imperfections, it is unlikely that all CEOs will be paid the unbiased value of their marginal product. The 'ex ante price level' in this market will typically not be first best efficient. It is therefore important to direct effort towards eliminating market imperfections, as this can improve market results. Enhancing operational and informational efficiency of the market can be induced by the following four ways: i) *Widening search criteria and the perception of the supply side of the market:* in the CEO hiring process, often only a small number of potential candidates are considered (Khurana, 2002b). This could result in a perceived lower supply curve and associated perception that a higher price needs to be paid. The wrong perception of the market supply curve contributes to higher CEO compensation. Executive search firms (ESFs) have made the CEO labour market more transparent by intermediating between the demand and supply sides of the market. ESFs and their principals should ensure that all suitable candidates are considered. This could involve disclosing the CEO vacancy and job requirements in the national or international public domain, and setting up a system that allows individuals to easily apply for the job without potential reputation damage; ii) *Improving transparency:* transparency on executive compensation has improved in many markets over recent years. A uniform way of reporting ex ante and ex post compensation will make the price ranges in this market even more visible. It should be noted, however, that improving transparency acts like a 'double-edged sword', as it triggers a 'non-economic' force towards increased imperfection of the market that should be actively controlled; CEOs striving

[66] A market is informationally efficient if all information available at that time is fully reflected in current prices at any time. Operational efficiency is a prerequisite for informational efficiency; if transaction costs are high, market parties might not find it worth their while to respond to new information. There is general consensus that share markets, for example, are informationally efficient, i.e. there are sufficient traders with negligible transaction costs. Research on financial market efficiency dates back to the 1960s, when the efficient market hypothesis (EMH) was formulated (Samuelson, 1965, Fama, 1965). The conclusion of Fama (1970) is that, with only a few exceptions, the efficient markets model stands up well and seems a good first approximation of reality, at least for the weak and semi-strong form of efficiency. Numerous studies have further examined the EMH, focusing primarily on the 'random walk hypothesis', 'variance bounds tests', 'overreaction and underreaction' and 'anomalies'. The EMH especially serves as a useful benchmark for measuring the relative efficiency of a market (Lo, 1997).

to be better paid than their peers. This informational efficiency paradox will be further discussed in section 2.3.4. Furthermore, the amount of noise regarding CEO abilities and skills could be reduced by storing information on public databases, e.g. via social media. In addition, ESFs act as market makers and foster networks of potential candidates; iii) *Lowering transaction costs:* sign-on bonuses as well as exit arrangements need to be modest in order to reduce transaction costs and decrease entry and exit barriers, thus improving efficiency in this market.[67] Direct transaction costs are also the fees of ESFs, for example. Due to the specific fee structure operated by some of these firms, indirect transaction costs can be induced as well. ESF fees are sometimes tied to the compensation package of the newly hired executive. The higher the CEO compensation, the higher the fee earned by the ESF. This could provide adverse incentives, e.g. selecting those candidates that are already highly paid. Indirect transaction costs constitute the higher compensation to be paid to the newly hired CEO induced by this fee structure. These ESFs therefore play a role in the continual surge of managerial remuneration. Companies should therefore only work with ESFs on a fixed fee basis, either based on success or not, to avoid adverse incentives; iv) *Selection of labour market peer groups:* establishing CEO compensation based on a peer group of other CEOs assumes homogeneity. As the combination of a specific CEO, in terms of skills, charisma, experience, etc., in a specific company, sector, size, scope, life cycle, etc., results in relatively unique investment combinations with associated risk premiums, it is important to regard collected market data for 'similar positions' as a point of reference only. Comparability can be increased by taking out investment combinations that do not resemble the company's situation, e.g. going concern versus a company that hired its CEO at a moment of financial distress. A peer group should, in principle, contain a large and robust number of companies in order to resemble the principle of perfectly competitive markets that no single market actor can influence market prices.[68] Peer groups should be reviewed regularly, and in particular when important company changes occur. For example, when the company becomes less complex as a result of divestments, etc., compensation levels should be adjusted downwards, based on an adjusted reference market. These downwards adjustments are especially important as the perception exists that executive compensation has only risen and has

---

[67] The Dutch Corporate Governance Code (2003, 2008) limits exit arrangements to one-year's basic salary.

[68] This is not always without difficulty. Especially for the largest companies in the economy, using a large peer group might not provide a workable solution, as there are only a relatively small number of large companies in an economy. Widening the market reference would thus imply using smaller companies with lower compensation levels. This might not provide a solution for the largest companies, as these companies want to attract the most highly skilled CEOs. Therefore lowering the market reference (taking into account less skilled CEOs of smaller companies) might result in setting an inefficiently low compensation level, possibly attracting less skilled CEOs.

never been adjusted downwards.[69] When setting pay above the median, it should be kept in mind that the CEO labour market resembles a click fund. When the market median has risen it seems to never come down, resulting from a focus on the upper half of the market and identifying only this part as 'competitive' pay levels. As imperfections exist to different degrees in different markets, it is important if and when foreign companies are selected in the labour market peer group, that this is done with great care. Including foreign companies implies importing imperfections from different markets due to different economic, legal, governance and cultural circumstances.[70] From an international perspective, countries outside of the U.S. that incorporate U.S. companies in the peer group will raise the market reference, because U.S. levels are generally much higher.[71] Paying more or less than, for example, the market median of the defined peer group does not necessarily indicate a suboptimal outcome, as further discussed in section 2.3.4.

Where markets fail, improvement could be made by legal requirements imposed directly by the government or indirectly by legally-anchored corporate governance codes regarding the elements listed above. Although eliminating all market imperfections would improve results, it is important to realise that imperfections will never be completely eradicated. A number of characteristics that are inherent to the CEO labour market are not in line with the characteristics of perfect factor markets. In this light, it should be noted that reducing imperfections in isolation, e.g. improving pay transparency, could even increase the imperfection of the market as a whole by importing non-economic or psychological forces. These statements should be viewed in light of the bargaining process in which the remuneration committee plays a pivotal role.

---

[69] In practice this might only be possible when a new CEO is hired resulting from contractual rights of the CEO in place. A different thought on keeping the remuneration level of the CEO equal is based on the question whether the company pays for skill/talent level or the complexity of the job. In case skill level is priced, the remuneration level should remain equal. The company could however decide to replace the CEO when less skill is needed to run the new firm and lower the pay of the new CEO. When the complexity of the job is priced, the company could decide to lower the compensation of the CEO. In this case, the CEO might decide to quit the job and look for a new company in which his or her skill level is fully leveraged.

[70] As an example, Core et al. (2004) compare contracting costs in the U.S. and Italy. As a result of the different legal circumstances, the contracting environment in Italy is less perfect than in the U.S. Within their environment, however, Italian firms might be contracting efficiently, given the imperfections, and the results under the U.S. contracting environment might in fact be inefficient. Therefore, results are difficult to compare directly. A different example is Kaplan (1997), who compares corporate governance and corporate performance of Germany, Japan and the U.S. These countries have differences in boards of directors, ownership, capital markets, takeover/control markets, and banking systems. The countries also have differences in CEO compensation: Germany, Japan and the U.S. are respectively categorised as moderate, low, and high, in terms of executive compensation.

[71] The Towers Perrin Worldwide Total Remuneration Survey (2006) indicates that CEO total remuneration for a typical manufacturing company in most countries equals 50% or less of U.S. CEO pay, especially caused by the significant long-term incentive component of CEOs in the U.S.

2.3.4 The role of the remuneration committee

The remuneration (/ nomination) committee is the spider in the executive compensation web. Its pivotal role originates from the imperfections in this market. Besides market forces, which are not necessarily competitive, the pricing mechanism in the CEO labour market boils down to pay negotiations between the CEO (candidate) and the company, assumed to be represented by this body. The invisible hand in the CEO labour market is thus supplemented by the visible hand of the compensation committee, which provides a perspective for policy makers. This section starts by indicating that the bargaining process is not only determined by economic forces, but also by psychological forces. Subsequently, an overview is provided of possible bargaining results, and the need for a different approach is identified in contrast to 'peer grouping' to assess the efficiency of market results.

Bargaining and the paradox of informational efficiency

In a bargaining situation, not only bargaining skill and power are important. According to Watson and Holman (1977), combining economics and psychology can provide additional insight. This touches upon the relatively new research area of the 'economics of happiness', which is an approach that combines the techniques used by economists with those more commonly used by psychologists.[72] In this light, a relevant psychological factor is based on Layard (2005), which refers to a study of Harvard University School of Public Health students to demonstrate the point that what makes people happy is their relative income, rather than their absolute income. As the level of transparency with regard to CEO compensation in most markets has become higher, CEOs are better informed about what is paid in similar jobs. In the bargaining process, CEO candidates will strive to be paid more than their peers, which results in a social comparison treadmill. In a situation where market power of CEOs has remained the same or has even increased, improving informational efficiency can create a paradox of increased informational efficiency actually resulting in a lower overall efficiency level, i.e. results are less efficient. Information becomes a controlling force in the bargaining process, resulting in an increased aspiration of the CEO candidate to maximise. This can produce pay increases in this market[73] regardless of shifts in demand and supply curves.

The company should thus set clear boundaries, possibly even upfront in a job vacancy published in the public domain, as the CEO candidate cannot be blamed for his or her will to maximise.

---

[72] This field of research relies on surveys of the reported well-being of individuals across countries and continents and on a more expansive notion of utility (Graham, 2005).

[73] In markets in which remuneration is not yet publicly disclosed this information efficiency paradox should be recognised. Increased informational efficiency by pay disclosure triggers non-economic/psychological forces and could result in a decrease in overall efficiency of this market, if pay negotiations are not adequately performed.

Potential remuneration results

As mentioned previously, the compensation committee cannot hide itself solely behind an invisible hand. It has significant room to manoeuvre and therefore largely determines the difference between optimal results[74] given market imperfections or suboptimal results. Table 2.19 provides an overview of potential bargaining results in three categories. The table is subsequently discussed.

Table 2.19: Bargaining result depends on the role of the remuneration committee

Role of the remuneration committee	Optimal (given market imperfections)	Suboptimal
Good intentions – efficient bargaining	1 (a, b)	
Good intentions – inefficient bargaining		2
Bad intentions/collusion		3

1. *Good intentions – effective bargaining*: the compensation committee performs its role as required. Contract bargaining occurs at arm's length. Subcategories:
   a) *Good intentions – effective bargaining – outcome is within currently observed market remuneration levels*: as a result of imperfections, different pay levels are observed for the same position in similar companies and similar situations. Based mainly on bargaining skills and power, the eventual result will be more in line with either the bottom half of the market or the top half of the market. If the company eventually decides, for example, to pay at the 75th percentile level, one could argue that the company has done less well in the contract negotiation.[75] However, from an economic viewpoint, the real malefactor is the degree of imperfection of this market allowing for a large bargaining space.
   b) *Good intentions – effective bargaining – outcome is higher than currently observed market remuneration levels*: the result is an outlier positioned outside the observed market range. The situation could result from the fact that a high-risk investment is required of a specific individual. The higher the risk, the higher the premium that needs to be paid to ensure the individual is willing to invest in the relationship, e.g. a company in financial distress.
2. *Good intentions – ineffective bargaining:* results are suboptimal due to lack of bargaining skills and/or an inefficient hiring process in which the bargaining power is shifted to the

[74] Core et al (2004) have indicated that imperfections do not necessarily imply that CEO compensation is not 'optimal' given the existence of information costs, transaction costs, etc. Optimality here refers to maximising the surplus on both sides of the market, given these imperfections.

[75] Note that this deviates from the Coase theorem (1960) often chosen in literature, or the efficient contracting perspective, in which informational problems are not present. One of the assumptions underlying this starting point is that the contract that the parties end up signing is independent of the bargaining process leading up to the signature of the contract.

CEO candidate. Khurana (2002 a, b) describes the process of narrowing down the number of CEO candidates and starting pay negotiations with the favoured candidate anxious to secure his or her services. Jensen et al. (2004) indicate that such a procedure is a recipe for paying too much for managerial talent. Although talented CEOs may be scarce, the described situation in fact results in a situation that resembles a bilateral monopoly.[76] When the compensation committee is unnecessary in the situation of a bilateral monopoly, this can result in a bargaining situation where 'price does not matter'.[77] The results may be inefficient and have no relation to the market price, casu quo range of market prices. In section 2.3.2 it was shown that the demand side of the market is not typically financially constrained. Such results may raise the ceiling of observed market figures. These results, which are not second best efficient, contribute to creating ever-increasing pay levels in the CEO labour market, called 'pay ratcheting', when a peer comparison is not properly performed.[78]

3. *Bad intentions/collusion*: results are suboptimal. In "Pay without Performance", Bebchuk and Fried (2004) advocate the view that executive compensation is not driven by market forces and arm's length bargaining between the remuneration committee and the CEO, but is the result of managerial power. Pay packages are characterised by 'camouflage' and only limited by public outrage, i.e. outrage costs.

The question of which of the three categories is most common, and in which variant, is heavily debated among empiricists. In order to say something about the efficiency of the bargaining outcome, a benchmark is needed against which to compare the set remuneration. Labour market peer groups will generally provide an insufficient anchor point to assess optimality, because: i) Homogeneity of peer comparison is limited: a combination of a specific firm with a specific individual, within a specific context, delivers relatively unique human capital investment combinations; ii) The labour market reference provides a collection of market figures which in turn can be the result of an optimal or suboptimal bargaining process and could fall in either of

---

[76] Duffhues and Jobsen (2007) indicate that contract negotiation in the CEO labour market often shows a clear comparison with the situation of a bilateral monopoly.

[77] There seems to be consensus amongst theorists that, in case of a bilateral monopoly, price is not determinate, and that buyer and seller tend to split the joint maximum profit (Watson and Holman, 1977). Different techniques are used to create more insight. For an econometric analysis, among others, please refer to Oczkowski (1999). For a simulation model including a situation of bilateral monopoly, among others, please refer to Duvallet, Garapin, Hollard, Llerena (2004).

[78] Companies that pay the CEO at the 75th percentile market level are often scrutinised for contributing to the pay-ratchet effect. Although this may be the case, it is important to note that these companies do not contribute to ever-increasing pay levels. If the company changes CEO compensation to this level, while in the past paying at the 25th percentile, the market median rises and this could result in upward adjustment of companies that reward at the median market level. However, the market 'ceiling' is unchanged, providing an eventual cap on pay increases. Companies that raise this ceiling contribute to ever-increasing pay levels especially if other companies, sometimes wrongfully, compare themselves with this particular company.

the three categories listed above. Without insight into the basis of the comparison, i.e. optimal versus suboptimal, a peer comparison to assess the optimality of a specific bargaining situation can result in drawing the wrong conclusion; iii) Finally, as indicated by category 1b, even when a bargaining outcome falls outside the peer comparison, i.e. observed market figures, it might still be optimal due to the specifics of the situation.

Duffhues and Jobsen (2006) state that the development of a risk-return model could enhance insight into executive pay practices. Further detailing and researching the perspective of human capital investments, risk and associated premiums, in light of the CEO compensation topic, is therefore an important topic for future research (see chapter 3). This is especially the case since the lack of accountability, due to the omission of an individualised benchmarking tool to assess the efficiency of the bargaining process, can be a recipe for setting off outrage costs,[79] particularly translated into reputation damage of those involved, increased prices demanded by suppliers, strikes of employees, etc.

The role of the compensation committee is to realise that negotiations have become more professional,[80] are affected by psychology, and are controlled by information. It should actively seek to minimise imperfections, i.e. take a clear stand on what the company is willing to pay, possibly employing their own professional contracting agent, widening the market reference, and to maximise informational efficiency, i.e. provide shareholders with a standardised summary report on pay levels and full insight into considerations, and maximise operational efficiency, i.e. minimise sign-on bonuses and exit arrangements.

2.3.5 Summary and conclusion

This section has focused on the dynamics of the executive *remuneration level* decision. Starting from the theoretically limiting case of the perfectly competitive market model, differences in compensation are mainly explained by differences in human capital. Ability in combination with investments in human capital, i.e. education, acquired skills and expertise, which result in relative scarcity, produce higher returns. This fundamentally explains why CEOs earn more than, for example, manufacturing employees, which is due to relative scarcity.

---

[79] Bebchuk and Fried (2004) use this term in the managerial power context. Outrage costs can be the result of perceived unexplainable unfairness. If the company is not able to provide insight regarding the 'fairness' of the remuneration outcome, especially in the case of an increase, this could trigger outrage costs.

[80] Jensen et al. (2004) provide an example of professional negotiators acting on behalf of the CEO to extract as much as possible from the company in the form of sign-on bonuses, salaries, target bonuses, long-term incentive grants, pension and other benefits.

Focusing on the CEO labour market demand and supply curves, I established that these are relatively inelastic for the largest listed companies in the economy. When an individual company is searching for a CEO, the labour demand is even perfectly inelastic. This is the result of no close substitution. Furthermore, companies are not easily deterred by high compensation levels, since CEO labour costs are only a fraction of the total costs of the company. There is only a very high natural cap from the demand side; in theory this is the point where the company cannot survive in the long-term and in practice the point where the market for corporate control acts when CEO pay is far from optimal. The market demand curve, which is largely a horizontal summation of individual demand, is therefore also relatively inelastic. This notion makes the perception and reality of the supply curve even more important in this market. Generally speaking, as a result of inelasticity, small shifts in either the demand curve or the supply curve can explain large changes in market prices from this perspective.

Further deduction rendered the view that the CEO labour market displays significant deviations from the perfectly competitive model. This conclusion is based on a comparison with the labour market segment for manufacturing employees, and with the share market, one of the financial markets, based on the essential characteristics of perfect factor markets. Operational and informational efficiency is lowest in the CEO labour market as a result of high transaction costs, imperfect information characterised by private information and noise, labour immobility and the impossibility of arbitraging. Due to these imperfections, there is no single market-equilibrium compensation level. The labour demand and supply curves therefore can contribute to explaining general market results and movements; however, these fail to explain individual remuneration packages.

The pricing mechanism in this market, apart from the invisible hand, consisting of weak competitive market forces, boils down to pay negotiations between the CEO candidate and the company assumed to be represented by the compensation committee, i.e. the visible hand of the compensation committee. The role of the compensation committee is to attract a qualified CEO at the lowest possible costs to shareholders. Poor bargaining and a misperception of the supply side of the market can prevent such a situation from occurring. Furthermore, increased compensation disclosure has provided CEO candidates with a strong psychological aspiration to maximise, i.e. being paid at least as good as the upper half of the market. This can result in an upward spiral, regardless of shifts in supply and demand curves.

Due to the fact that there is no single equilibrium price, stakeholders are unable to assess whether the remuneration committee members have performed their job well. Pay differences between CEOs in similar situations can, for example, be the result of inequalities in complexity that are difficult for the outside world to determine. However, they can also be the result of an excellent, or poorly, conducted negotiation. A labour market peer group comparison, in isolation, cannot be used to assess the situation, given the highly individual character of the human capital investment situation, i.e. a combination of a specific firm with a specific individual within a specific context. In case of compensation that is perceived as too high, this could offset 'outrage costs' that damages the company and its value, especially in an untrusting world that requires increased levels of disclosure and shareholder voting on remuneration policies.[81]

[81] In various countries, this is already the case. In the Netherlands, the remuneration report, drafted by the remuneration committee, summarises and explains the remuneration policy for the Board of Management. This policy is tabled for adoption at the AGM. This system of a 'binding vote' goes beyond the practice in, for example, the UK, where shareholders have an 'advisory vote'.

2.4 Remuneration structure: incentive contracts - a balancing act

The previous section 2.3 explored the CEO labour market. The price level that is negotiated provides an expected value of the compensation of the CEO. The eventually realised or ex post compensation can be very different from the expected compensation, and depends on the specific conditions in the contractual labour agreement in combination with achieved performance. The structure of the variable compensation components in the contract determines the magnitude of this deviation and thus the associated risk for the executive.

This chapter provides an overview of the contracting difficulties that give rise to and are associated with variable compensation and, furthermore, the groundwork, as well as important advances that have been made in agency theory during the past approximately 30 years. Practical comments are made in section 2.4.4, which discusses the role of the remuneration committee, and shows that there is room for alternative hypotheses.

2.4.1 Classic agency problem – optimal contracting perspective

Issues regarding incentive pay are closely related to the theory of contracts. In the 1970s, the 'theory of contracts' originated from the failures of general equilibrium theory to adequately take into account realistic parameters, such as the possession of private information by contracting parties (Salanié, 1997). To analyse the problem of parties bargaining over the terms of a contract, involving asymmetric information, game theory was resorted to. The theory of contracts covers a lot of ground and many varied situations, and can be distinguished along several axes: i) Static or dynamic; ii) Involving complete or incomplete contracts; iii) Describing bilateral or multilateral relationships, etc.

Principal – agent paradigm

The study of bargaining under asymmetric information is quite complex. Therefore the 'principal-agent' paradigm has been introduced as a simplifying tool. It allocates all bargaining power to one of the parties. This party will propose a 'take it or leave it' contract and therefore requests a 'yes or no' answer; the other party is not free to propose another contract. The principal-agent game is therefore a Stackelberg game in which the leader, who proposes the contract, is called the *principal*, and the follower, the party who just has to accept or reject the contract, is called the *agent*. In the model, the utility of one party is maximised, while the other is held to a given utility level.

According to Salanié (1997), bargaining under asymmetric information can be associated with who the party *is*; what his characteristics are, called hidden information, or what the party *does,* i.e. the decisions he takes, called hidden action.

Hidden information is studied within adverse selection models as well as signalling models. *Adverse selection models*[82] entail the private knowledge of a cost or preference parameter, such as talent or risk-aversion. In such models, the uninformed party, principal, is imperfectly informed of the characteristics of the informed party, agent; the uninformed party moves first. Other terms that are used for these models are 'self selection' and 'screening' models. The objective of these models is to make the agent reveal their characteristics by offering a menu of contracts from which the different types of informed agents choose according to their private characteristics. In *signalling models*, the informational situation is the same as under adverse selection models; however the informed party moves first in these models by sending a signal that may reveal information relating to his or her type. The uninformed party then tries to decrypt these signals by using some interpretative scheme.[83] In terms of executive compensation, contracting under hidden information will be briefly discussed in the next section 2.4.2.

Hidden action or *moral hazard models* entail the private knowledge of an action of the agent, such as effort.[84] The uninformed party, principal, moves first and is imperfectly informed of the actions of the informed party, agent. Moral hazard involves the following elements: i) Agent

[82] A seminal article on adverse selection has been written by Mirrlees (1971). Exploring optimum income taxation, to maximise a utilitarian social welfare function, Mirrlees defines income as the product of labour supply and talent. Talent in this respect is the adverse selection parameter. However, observable visibility of the income reduces this problem. The principal-agent model with adverse selection has also been useful in analysing the insurance market, in which probability of accident is the adverse selection parameter, for instance in Stiglitz (1977), and for the analysis of banking contracts, in which the adverse selection parameter is the efficiency of the borrower, for instance in Gale and Hellwig (1985).

[83] Important early contributions include: Akerlof (1970), who showed that a market may function very badly if the informed party has no way to signal the quality of the goods it is selling; for an example, please refer to the market for second-hand cars. In the model of Spence (1973), the signal that is sent by the informed party has a cost that depends on its type, so that higher types are more likely to send higher signals. This signal may then help the uninformed party to distinguish the different types. The Crawford-Sobel (1982) model shows that even if the signal is purely extrinsic, if it has no cost for the informed party and thus constitutes 'cheap talk', both parties may still coordinate on equilibria that reveal some information.

[84] The problem of moral hazard was originally analysed in the medical care market by Arrow (1963). Arrow stated that because agents can affect, by their behaviour, medical expenses or the probability of the health risks they face, insurance companies cannot offer proper coverage of medical risks. Arrow also calls for public intervention when insurance markets do not emerge because of moral hazard. Although optimal risk sharing is usually prevented by moral hazard, Pauly (1968) disputes the fact that the government faced with the same informational constraints can do better. The first attempts to model moral hazard have been performed by Zeckhauser (1970), Spence and Zeckhauser (1971) and Ross (1973).

takes a decision or action that affects his or her utility and that of the principal; ii) The principal only observes the 'outcome', which is an imperfect signal of the action taken; iii) The action the agent would choose spontaneously is not Pareto optimal. Since the action is unobservable, the principal cannot force the agent to choose an action that is Pareto optimal. The principal can only influence the choice of action by the agent by conditioning the agent's utility to the only variable that is observable: the outcome. This, in turn, can only be done by giving the agent a transfer that depends on the outcome. Section 2.4.3 will focus on contracting under hidden action. The objective is to distil out a number of predictions for the practice and reality of executive compensation that are rooted in the theory of optimal contracts. The primary focus will be on the solutions to the principal's problem as provided by a number of seminal studies.

2.4.2 Contracting with hidden information / adverse selection

The contracting problem in the case of hidden information is to design a contract that effectively separates agents with different hidden types, so that agents from each class only select contracts intended for their type. The different contractual solutions will not be further specified, but problems that hidden information causes in the specific case of the CEO labour market will be briefly addressed. In a 'normal' hiring process of a manufacturing employee, for example, the job vacancy is often publicly known, e.g. by means of advertisement. The more people know about the vacancy the better, as this results in a possibly larger pool of applicants, which potentially allows for a better choice. In a standard case, a number of people will apply for the job. By screening, i.e. checking references, education, etc., and offering a specific type of contract that is intended for the type of individual the company is looking for, the right person for the job can be selected more or less through a self-selection process. The fact that characteristics being sought cannot be directly observed, therefore, does not always cause a problem.

In the specific case of the executive and CEO labour market, the vacancy is not often publicly known. Khurana (2002) has indicated that this market segment is characterised by covertness and a high degree of risk. Executive Search Firms operate as market makers. As a result of hidden information and the significant adverse consequences of choosing the wrong person for the job, only candidates will be invited who, one way or another, have publicly shown their capability for doing the job.[85] This is especially the case in large publicly listed firms. As a result, individuals who are capable of doing the job, but are not on the 'radar screen' of the remuneration and/or appointment committee, will not be invited. As a result of the fact that the vacancy is not publicly known these individuals are also not able to initiate a job application.

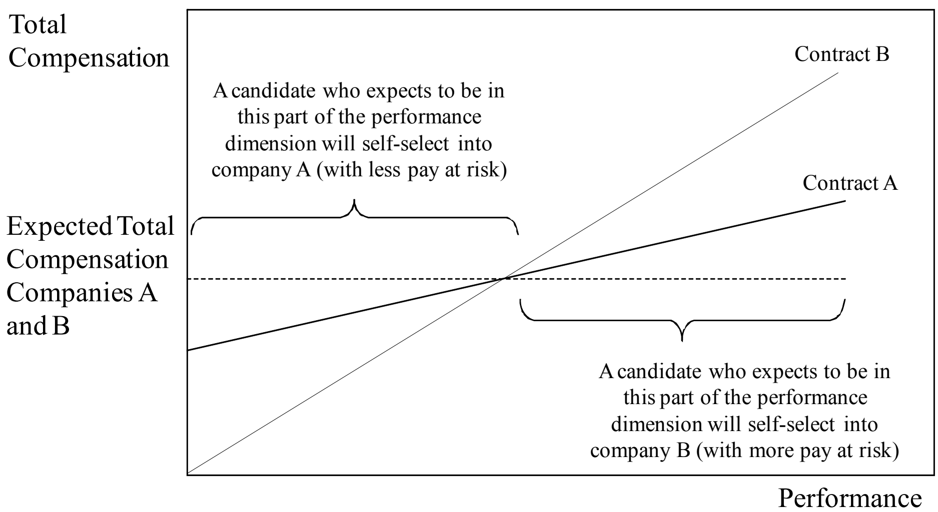
[85] Khurana (2002a, b) indicates that, for the hiring process within large firms, only a small number of candidates are considered whom most people know off the top of their heads.

The first situation mentioned above results in a perceived lower labour supply, and the latter in an increased inelasticity of the labour supply curve. CEO ex ante compensation rises as a result, and the characteristics sought might only be partially found.

Note that the basic lesson of adverse selection theory of offering a menu of contracts still stands. Suppose a candidate with entrepreneurial spirit is searched for with a relatively low risk profile. In such a case, the contract should be designed to ensure the right candidate will 'self-select' into the job. The offered contract may contain more pay at risk, effectuated by the obligation for the candidate to buy a certain number of shares in the company,[86] for example. Alternatively, the pay-for-performance relationship can be more pronounced, more risk or leverage. In figure 2.9, this would be contract B as opposed to contract A.[87]

Figure 2.9: Self-selection as a result of the shape of the compensation plan

This figure shows two contracts with equal expected costs for the company. Based on the perception of the value of the contract for the CEO candidate, a choice is made between more security, contract A, or more risk, contract B.



The self-selection mechanism thus contributes to a situation in which candidates with a certain type of risk profile and cost of effort function will self-select into or out of the company.

In the next subsection, the agency problem, characterised by hidden action and the associated contracting difficulties, is further explored.

---

86 Note that wealth constraints could limit the practical application of these types of contracts. On the other hand, these contracts might particularly attract wealthy individuals, as they are generally less risk-averse.

87 Based on Jensen (2003), page 402

2.4.3 Contracting with hidden action/moral hazard

The principal–agent problem in a modern firm, which is characterised by the separation of ownership and control, was identified by Berle and Means (1932) and was formalised by Jensen and Meckling (1976).[88] This agency problem is specifically apparent in the relationship between the shareholder and the manager of a corporation. A trade-off between debt and equity finance was developed to minimise agency costs.[89] The disciplinary effects of debt financing reduce perk consumption by management. However, borrowing becomes costly when debt levels are large, with the possibility of financial distress. At this point the manager will have an incentive to engage in excessively risky projects/investments, which benefit the owner if the project succeeds and hurt the creditor if it does not.[90] The optimal debt/equity ratio of the firm is determined at the point at which the marginal benefit of keeping the manager from taking perks is offset by the marginal cost of causing risky behaviour. The theoretical shortcoming of Jensen and Meckling (1976), however, is that agency problems can generally be solved more efficiently by putting the agent on an incentive scheme rather than by using the financial structure of the company.[91] The optimal contract between a principal and an agent is the

---

[88] Jensen and Meckling (1976) do not focus on how to structure the contractual relationship between the principal and the agent to provide appropriate incentives for the agent to make choices that will maximise the principal's welfare, given that uncertainty and imperfect monitoring exists. They assume that individuals will solve these problems. The important aspect of their study is that they indicate that this cannot be done at zero costs if both the principal and the agent are utility maximisers. The real costs associated with the agency problem are defined as the sum of: the *monitoring expenditures* by the principal, the *bonding expenditures* by the agent, and the *residual loss*: this refers to the monetary equivalent of the reduction in welfare of the principal as a result of the remaining divergence between the agent's decisions and those decisions, which would maximise the welfare of the principal, which cannot be eliminated by monitoring or bonding.

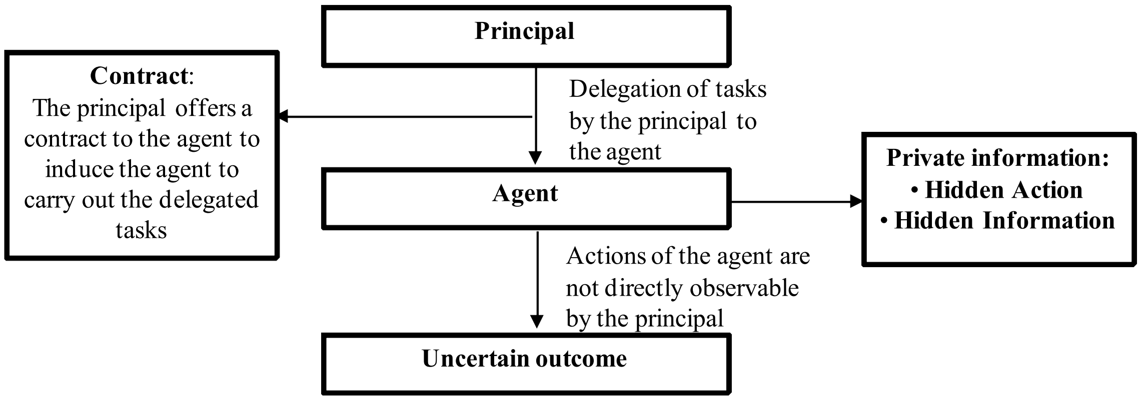
[89] Before the development of the asymmetric information paradigm, the single most important consideration affecting a capital structure decision was thought to be taxes. Modigliani and Miller (1958, 1963) had drawn attention to the large tax-arbitrage gains to be made from the tax deductibility of corporate interest payments, generally favouring debt over equity, up to a certain point at which financial distress costs dominate on a marginal basis.

[90] Stulz (1990) extended the model of Jensen and Meckling (1976) and formalised the ideas expressed by Jensen (1986) concerning the benefits of debt as a control mechanism on wasting free cash flows by investing them in uneconomic projects. Stulz assumes managerial utility is increasing in the amount of money invested in the firm. Financing policy matters, as it reduces the agency cost of managerial discretion. Managerial discretion has two costs in a situation that observes neither cash flow nor management's investment decisions: an *overinvestment cost,* which arises because management invests too much in some circumstances, and an *underinvestment cost* caused by management's lack of credibility when it claims it cannot fund positive NPV projects with internal resources. In this case, it may be optimal for shareholders to prohibit future external financing and to impose an initial debt ratio, which is such that it balances the marginal cost of good investment projects foregone when the free cash flow turns out to be low, against the marginal benefit of bad investment projects avoided when the free cash flow turns out to be high. It thus provides a theory of optimal capital structure under asymmetric information.

[91] Hart (2001) provides an example to illustrate this point: suppose a principal hires an agent to sell silverware. The job is to drive around and knock on people's doors and try to interest them in knives and forks. The principal may be worried that the agent will sit in the car all day and listen to rap music and not sell the product. One solution to this problem is to pay a fixed amount per set of silverware that is sold. Note that it is not necessary to make the agent a shareholder of the silverware firm to induce hard work.

contract that minimises total agency costs. The basic 'agency problem' is summarised in figure 2.10:

Figure 2.10: basic agency problem



The *agency problem* focuses especially on the incentive problem that arises as a result of the agent performing tasks for the principal. The principal is concerned that the manager engages in tempting alternatives, instead of finding and investing in all positive net present value (NPV) projects open to the firm (Brealey and Meyers, 2000), such as: i) *Reduced effort (under-investment)*: finding and implementing investments in truly valuable projects is a high-effort, high-pressure activity. The manager will be attempted to slack off; ii) *Perks*: the manager can consume company assets by buying tickets to sporting events, office accommodation, plan meetings at luxury resorts, etc. These non-pecuniary rewards are often referred to as private benefits or perquisites; iii) *Empire building (over-investment) and entrenching investment*: managers usually prefer to run large businesses rather than small ones. Getting from small to large may not be a positive-NPV undertaking (Jensen, 1986, 1993). This issue of over-investment is also often apparent in cases of entrenching investment, which are projects designed to require or reward the skills and experience of existing managers (Schleifer and Vishny, 1989); iv) *Avoiding risk*: if a manager only receives a fixed salary and cannot share in the upside of risky projects, then safe projects are better than risky ones from a manager's viewpoint. However, risky projects can have large positive NPVs.

To induce the agent to carry out the task delegated by the principal, a contract[92] is offered to the agent by the principal. The contract should ensure that the agent acts in the interest of the

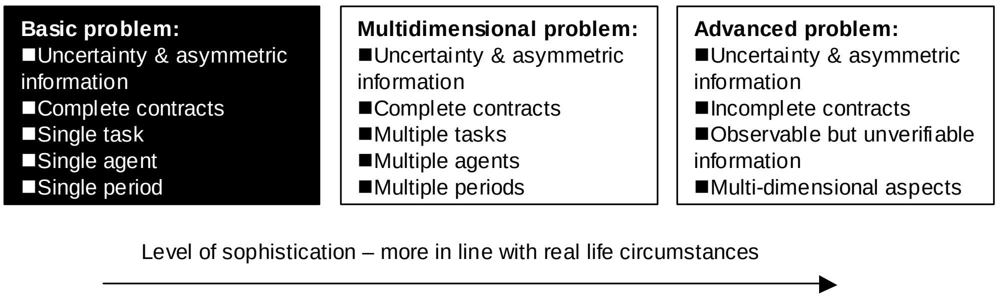
[92] In contracting theory, the contract offered by the principal can be explicit, implicit or both. An explicit contract is guaranteed by a third party, e.g. a court or a mediator. An implicit contract relies on a system of behavioural norms, for instance, and will need to be sustained as an equilibrium in the interaction between parties.

principal. The difficulty of designing an efficient or optimal contract[93] lies in the previously-mentioned characteristics of the principal-agent relationship; as the agent owns private information and the eventual outcome based on his actions is only indicative of his private information, the solution to the principal's problem is not usually Pareto-optimal (Ross, 1973).

The theoretical literature has evolved, from high level thinking on possible solutions for the principal's problem, towards providing both explanations and recommendations for the structure of real life incentive contracts. To provide insight into the major developments, three building blocks are created. These blocks range from the basic moral hazard problem to the more advanced problem under incomplete contracts (Bolton and Dewatripont, 2005). Each block is discussed below.

Figure 2.11: Overview agency literature – panel A

Basic moral hazard problem.



The groundwork of agency theory was laid down in the late 1970s and early 1980s, establishing the classic model in agency theory, such as that of Jensen and Meckling (1976), Holmstrom (1979 and 1982), Grossman and Hart (1983), and others. In a typical 'hidden action' model, the agent, e.g. the CEO, is assumed to take actions to produce stochastic shareholder value and in return receives a certain amount of compensation. The utility function is positively based on compensation and negatively on actions. The CEO's utility function and the production function linking the CEO's actions to output are common knowledge to both shareholders and the CEO, but only the CEO observes the actions taken. That is, the shareholders know precisely what actions they want the CEO to take, but cannot directly observe the CEO's actions. The optimal

[93] Note that there is a difference between a contract that can be considered optimal in the first best or second best sense, and a contract that is considered complete. According to Hart and Holmstrom (1987), the vast majority of the theoretical work has been concerned with what might be called complete contracts. In this context, a complete contract is one that specifies each party's obligations in every conceivable eventuality, rather than a contract that is fully contingent in the Arrow-Debreu sense. According to this terminology, an asymmetric labour contract can be just as complete as a symmetric information contract. It is important to note that, in reality, it is usually impossible to lay down each party's obligations completely and unambiguously in advance, so that most actual contracts are seriously incomplete. Incompleteness can further lead to departures from the first best solution, even when there are no asymmetries of information between the contracting parties, and the parties are also risk-neutral.

contract maximises the risk-neutral shareholders' objective, firm output minus CEO compensation, subject to an incentive compatibility constraint, i.e. the CEO chooses actions to maximise his or her utility, and a participation constraint, i.e. the expected utility of the contract must exceed the CEO's reservation utility. The fundamental insight emerging from the traditional principal-agent models is that the optimal contract mimics a statistical inference problem: the payouts depend on the likelihood that the desired actions were actually taken. This 'informativeness principle', introduced by Holmstrom (1979), suggests that performance measures are chosen to the extent that they provide information on whether the CEO took the actions desired by shareholders.

The informativeness principle leads to a number of other insights with regard to efficient incentive contracts: i) Besides using share-based measures in incentive contracts, the informativeness principle allows for a role for additional performance measures, such as accounting returns.[94] Non-share-based measures will be used to the extent that they provide information relevant in assessing whether the CEO actually took the desired action. In fact, if these other measures constitute a 'sufficient statistic' for the CEO's actions, share-based measures need not be used at all;[95] ii) Based on the same principle, Holmstrom (1982a) suggests that optimal incentive contracts for risk-averse executives should depend on Relative Performance Evaluation (RPE), as this will yield similar effort incentives, compared to absolute performance-related contracts, but with less compensation risk for the executive, by removing common shocks experienced by all firms in the same industry over which the CEO has no control. RPE will lead to reducing moral hazard costs and a more optimal risk-sharing ratio.

[94] Especially in accounting literature, the informativeness of performance measures has been a subject of research. Lambert and Larcker (1987) argue that, while market returns may be the 'correct' measure of performance from the perspective of the shareholders, such measures may not be the best indicators of managerial actions. Relying on Holmstrom (1979), they argue that the important characteristic of a performance measure is whether it provides information on managerial action. In designing management compensation contracts, what matters is that the performance measure has a high signal-to-noise ratio, i.e. that the information about managerial action captured by the performance measure can be distinguished from the random noise in the measure.

[95] Bushman and Smith (2001) indicate that compensation can be positively as well as negatively related to accounting performance: i) The direct incentive hypothesis, positive relationship: CEO effort in a given year can sometimes be better measured by accounting performance than by share prices, as share prices might have already incorporated this, thus in one sense share prices measure relative performance, i.e. relative to investor's expectations; ii) Filtering hypothesis, negative relationship: is based on the assumption that the noise component in accounting performance is correlated with the noise component in share price performance. If, for example, the noise component is positively correlated with the noise in share price performance, the filtering hypothesis implies a negative correlation between accounting performance and CEO compensation. Another reason why accounting measures are used in practice includes the fact that instances could occur in which the objective of the principal is difficult to contract. The weight that should be allocated to 'price versus non-price measures' as Core, Guay and Verrecchia (2003) have called it, depends on the 'quality' of the measures in the specific company, as discussed in the section on multidimensional moral hazard problems.

Empirical evidence on the use of RPE is mixed[96] (Prendergast, 1999). Murphy (1999) shows that RPE is hardly ever used in long-term incentives. Bertrand and Mullainathan (2001) found that CEOs are rewarded for luck, defined as observable shocks to performance beyond the CEO's control. The overall conclusion seems to be that RPE has been absent in most executive compensation contracts,[97] given the fact that there are benefits as well as costs in the use of RPE.[98] In long-term incentive schemes, a sharp increase of RPE was observed, in the Netherlands, after the introduction of the Dutch Corporate Governance Code (2003). Best practice provisions II.2.1 and II.2.3 require options and shares to be linked to predetermined performance criteria for options, and clearly quantifiable and challenging targets for shares. As a result, a significant number of large listed Dutch companies started to introduce relative TSR plans in 2004 and 2005 (Haanen, Maas and Triest, 2006);[99] iii) Also based on the informativeness principle, Grossman and Hart (1983) determined that the optimal sharing rate could be linear, convex or concave, and does not need to be positive throughout its entire range.[100]

---

[96] Gibbons and Murphy (1990) report the strongest support for the RPE hypothesis based on 1974-1986 data from 1049 U.S. firms. They found that changes in CEO pay are positively and significantly related to firm performance, but negatively and significantly related to industry and market performance. The research is not convincing to Janakiram, Lambert and Larcker (1992) and Sloan (1993), who relax the findings of Gibbons and Murphy (1990).

[97] The Towers Perrin 2004 European Annual Incentive Plan Survey, for example, reports on the prevalence of performance standards among 198 large European companies: most companies, 65%, use a budget approach. Only 4% use a peer group/relative performance measurement to set targets for the short-term incentive plan.

[98] Lambert (2001) argues that there are also costs associated with RPE: i) There may be counter-productive arguments concerning which components are controllable and which components are non-controllable political costs with shareholder groups. When executives are paid large bonuses if their firm's share price has gone down, even if the decrease is not as large as the decrease for peer firms, it can motivate destructive competition between agents, i.e. sabotaging their performance instead of improving your own. The use of RPE might lead to poor strategic decisions, e.g. picking lines of business in which the competition is 'easy' as opposed to picking the ones in which you will do best on an absolute basis, in which removing the impact of a variable from the agent's performance measure reduces his incentives to forecast that variable and modify the firm's strategy on the basis of this information, e.g. even if oil prices are exogenously given, you may still want the executive to attempt to forecast what oil prices will be and to design a strategy for the firm that is best, given that strategy such as inventory decisions, hedging positions, pricing contracts, etc. Executives can achieve some of the benefits of RPE on their own. They may be able to re-allocate their portfolio of wealth to remove a position of the market-related risk, as a result of which it is unnecessary for the firm to do this with a compensation contract.

[99] These plans grant options and/or shares conditional upon the achievement of TSR performance relative to a group of predefined peers/competitors. Note that, within these plans, only the allocation mechanism is based on RPE. The gain on the shares or options is not relative, such as is the case with indexed options, for example, promoted by Rappaport (1999).

[100] Although this might be theoretically true, it is questionable whether this is relevant for the practice of setting efficient contracts. As agents in the real world face a wider range of alternatives and principal, a more diffuse picture than assumed in traditional agency models, optimal rewards for CEOs are linear in the agent's aggregate performance (Holmstrom and Milgrom 1987). Non-linear performance incentive zones in sequential action models lead to gaming. Please also refer to Gibbons (2005) and Jensen and Murphy (2004).

The traditional principal-agent model yields several important and practical insights useful in understanding existing contracts and, normatively, in designing better ones. In particular, the models highlight the trade-off between risk and incentives, as illustrated by the simple agency model. The optimal sharing rate is provided by Haubrich 1994, among others, as:

$$s^* = 1/(1+\eta c\sigma^2) \qquad \textbf{[2.1]}$$

where s^* equals the optimal sharing rate, η equals the agent's coefficient of absolute risk aversion, c equals the agent's cost of effort, and σ^2 the variance of firm performance.

Equation 2.1 explains lower pay-for-performance sensitivities by higher levels of risk aversion (η), cost of effort (c) and/or large uncontrollable noise in firm performance (σ^2). The test of the classical model is therefore based on the predicted negative relationships between 's', on the one hand, and 'η', 'c' and 'σ^2' on the other. As risk aversion and cost of effort are difficult to observe, Garen (1994) and Aggarwal and Samwick (1999) focus on the assumed negative relationship between the sharing rate and the variability of firm performance (σ^2). Both studies indeed found this negative relationship over different periods: 1974-1988, low statistical significance, and 1993-1996, high statistical significance, respectively. Agents will thus have weaker incentives when the variance of the performance measure is larger.[101]

The sharing rate is often referred to as the pay-for-performance sensitivity (PPS). There are numerous empirical studies researching the level of this pay-for-performance sensitivity in real life compensation contracts, especially in the U.S. and the UK. Van Praag (2005) provides an overview of 26 studies including, among others, influential work of Jensen and Murphy (1990) and Hall and Liebman (1998). Jensen and Murphy (1990) researched 2,213 firms over the period 1974-1986 and found an average CEO PPS of 0.00325 or USD 3.25 per USD 1,000 change in shareholder value.[102] The incentive is equal to owning 0.325% of the company's share. The PPS has increased over time as shown by the study of Hall and Liebman (1998). They researched 478 U.S. Fortune 500 companies over the period 1980-1994 and found a PPS of USD 6 per USD 1,000 for the year 1994, which is an almost doubling of the PPS in relation

---

[101] This supports a general principal-agent framework, but does not identify which specific agency problem generates the data; under-investment, as a result of private costs of additional positive NPV investments that require additional work, and carrying overseeing responsibilities for that investment, or over-investment, taking on wasteful, negative present value investment projects because private benefits are derived from controlling more assets. Over the period from 1993 to 2001, Aggarwal and Samwick (2006) found that investment is increasing in incentives and, furthermore, that firm performance is increasing in incentives. This is in line with models of under-investment.

[102] The PPS in this study includes basic salary, bonus payments, share options, share ownership and threat of dismissal. Note that the PPS for the smallest companies in the sample is higher than for the largest companies: USD 1.85 and USD 8.05 per USD 1,000 respectively.

to the study of Jensen and Murphy (1990).[103] Changes can be largely attributed to changes in share options and share holdings. Many other aspects of the PPS have been explored in various studies, including:

i*) PPS versus incentive strength*: from a different perspective, Hall and Liebman (1998) state that incentives arising from the empirically observed PPSs can be significant as a result of the fact that even small sharing rates can cause significant absolute value swings in CEO wealth. This would result in adequate decision-making. Hall and Liebman (1998) provide the example of a CEO choosing between two projects with different expected payoffs and private benefits. Project A has expected returns of USD 350 million more than the expected return of project B, but project B yields private benefits that the CEO values at USD 1 million. In this case the CEO needs to be paid USD 1 million more, plus one dollar, for choosing project A. In this case, even if the CEO receives only USD 3.25 per USD 1,000 of added market value, the CEO will choose the correct project, which would result in USD 350,000 * USD 3.25 = USD 1,137,500 extra compensation when choosing project A;

ii) *PPS versus incentive strength in small and large organisations*: the PPS is lower in large organisations than in small organisations. In line with the above, Baker and Hall (2004) show that the agency problem is not necessarily larger in these firms as a result of this. The crucial parameter is the elasticity of CEO productivity with respect to firm size. CEO marginal product rises significantly with firm size, following the chain letter effect of Rosen. Thus, a lower PPS, in large firms, should be multiplied by a larger marginal product of effort (γ) to obtain incentive strength. Their results show that overall incentive strengths in small and large organisations are generally similar. Intuitively, this can be explained by looking at the dollar stake in the company. A lower PPS within a large company reflects a significant absolute money stake. A higher PPS within a smaller company could reflect a similar money stake;

iii) *International PPS differences*: an example is the study of Conyon and Murphy (2000), which shows that the PPS based on share ownership in the UK is significantly smaller than in the U.S. A U.S. median PPS of USD 14.8 and a UK median PPS of USD 2.5 per USD 1,000 was found over the year 1997. Milbourn (2001) provides the PPS of Dutch firms in relation to the result of Conyon and Murphy (2000). Working with the PPS of the full management board, he concludes that median figures are similar to the practice in the UK, but significantly and systematically below U.S. figures;

---

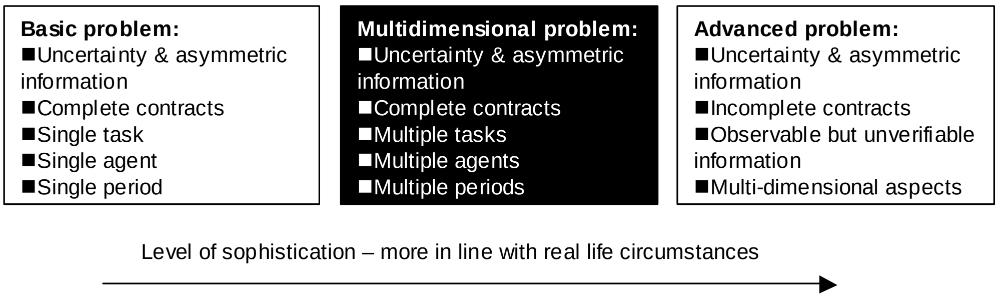
[103] As companies tend to increase in size over time, and the PPS of larger companies is lower than that of small companies, a size-adjusted PPS would have quadrupled the Jensen and Murphy PPS instead of the observed doubling.

iv) *Risk profile and effort aversion*: η and c are important parameters to mitigate the agency problem when the variability of firm performance is a given. Reducing the agency problem, within the classical framework, involves trading-off insurance and incentives. If it is possible to provide the CEO with a significant variable package, to obtain a high s*, agency costs will ceteris paribus be reduced. Hiring the right CEO is therefore essential. The right CEO here refers to an entrepreneurial agent with low risk and effort aversion, in addition to the right skills and capabilities. Note that providing an incentive for undertaking a risky project does not necessarily equal an incentive for effort, i.e. working hard to implement the chosen project. Hirshleifer and Suh (1992) state that the optimal curvature of the PPS, linear, concave, or convex, depends on the trade-off between controlling project risk and motivating effort. The analysis predicts greater option-based compensation, convex payoff, to counterbalance the agent's risk aversion when there are desirable but risky growth opportunities, as proxied by Tobin's Q or R&D expenditures, and less option compensation when there are effective monitoring institutions, such as large shareholder[104] and bank lenders.

Although the classic agency model provides a number of fundamental insights with regard to the trade-off between insurance, i.e. fixed compensation, and incentives, i.e. variable compensation, it has proven to be too limited to fully explain real-life incentives. This is clearly articulated in the literature that studies the agency problem as a multidimensional issue.

Figure 2.11: Overview agency literature – panel B

Multidimensional moral hazard problem.



The classic model of moral hazard highlights the trade-off between fixed and variable compensation, i.e. to what extent will pay be at risk? It reveals the importance of the informativeness principle, measuring the likelihood that a certain action is undertaken. As CEOs

[104] Shleifer and Vishny (1986) describe the value of a large shareholder and analyse the role of these shareholders as monitors of management, developers of new strategies and facilitators of takeovers: they show that the value of the firm increases with the size of the large shareholder stake.

can choose from a much richer set of actions than contemplated under the original principal-agent framework, and over multiple periods, extensions to the classic agency model were developed in the late 1980s and the beginning of the 1990s. The objective of this literature is to capture the practice of incentive contracts more adequately. Below, the basic model is extended to incorporate: multiple tasks, multiple agents (tournament theory) and multiple periods.

Multiple tasks

The role of the informativeness principle in compensation contracts is reduced in the more realistic multidimensional setting. It is questionable whether shareholders know exactly which CEO actions maximise firm value. The reason that shareholders entrust their money to self-interested CEOs, is based on their beliefs that CEOs have superior skills or information to make positive or favourable net-present-value investment decisions. The multitask literature shows that CEOs can choose from a wide array of activities that affect shareholder value, including: defining the business strategy, choosing between debt and equity financing, making dividend and repurchase decisions, identifying acquisition and divestment targets, selecting industries and markets to enter or exit, allocating capital among business units, setting budgets for developing new products and businesses, hiring productive subordinates and firing unproductive subordinates, and designing, implementing, and maintaining the nexus of implicit and explicit contracts that defines the organisation.

The relevance of the multitask literature, e.g. Holmstrom and Milgrom (1991),[105] is that it provides a theoretical framework for the common understanding that the fundamental shareholder-manager agency problem is not getting the CEO to work harder, but rather getting him or her to choose actions that increase rather than decrease shareholder value. If a CEO can choose from an almost unlimited action set, according to Murphy (1999), he or she could also decide to: i) Sandbag the budget process to achieve performance targets; ii) Attenuate the benefits of relative performance evaluation by taking unproductive actions that lower the performance of the peer group; iii) Shift accounting returns across periods by accelerating or delaying revenues and costs; iv) Monitor year-to-date performance and adjust actions on a daily basis to maximise bonuses based on cumulative annual performance; v) Make accounting choices that artificially inflate or deflate reported earnings; vi) Make investment choices, such as cuts in R&D, which increase short-term profits at the expense of long-term profitability.

[105] The groundwork of multitasking models can be attributed to Lazear (1989) in a tournament setting, Baker (1992) with regard to the choice of performance measures, and Feltham and Xie (1994) regarding the value of performance measures within a multitask setting.

Multitask models are all characterised by multidimensional actions, and are occupied first and foremost with the issue of distortion. The term 'distortion' is introduced to emphasise the possibility that incentives can create distortive behaviour, i.e. behaviour which is not in line with the company's goal. This emphasises the benefit of tying variable pay to the principal's objective, i.e. increasing shareholder value.[106] Non-share price measures will be selected to the extent that they provide incentives to take actions generally consistent with value maximisation, rather than measures that are incrementally informative of CEO actions. In terms of the quality of performance measures, Baker (1992) and Baker (2002) show that this is a trade-off between distortion and risk, in other words: between goal alignment and line of sight, i.e. influence of the CEO on the outcome.[107]

The more distorted and riskier the measure, the less valuable it will be to the organisation and the less it will be used in an incentive contract.[108] Which performance measure should be used ideally is still topic of debate. Jensen (2003) advocates economic profit or EVA™ but acknowledges that it still needs to be figured out how managers can be motivated to make value-creating decisions that generate negative economic profits in early years while returning large positive economic profit in later years. In this light, Duffhues (2006) advocates more transparency with regard to the developments of the eventual goal of the company, i.e. value creation. Companies should disclose a 'segmented market-value balance sheet' reflecting the usual accounting balance sheet, segment 1, and a second segment indicating the additional value, above the cost price of segment 1. Disclosing this segmented balance sheet and the resulting Tobin's Q, the sum of segments 1 and 2 divided by segment 1, is at the heart of good corporate governance and also provides an important performance measure of managerial actions. Consequently, it deserves an important place in executive compensation contracts.

In conclusion, the most important lessons of the multitask literature are (Gibbons, 1998, 2005): i) An increased set of CEOs' actions leads to incentive structures that are linear, rather than

---

[106] Holmstrom and Tirole (1993) show that share prices are uniquely suited for compensation purposes, not so much as they are accurate, but because they are an objective third party assessment, unlike the subjective assessment of the board of directors and/or supervisory board.

[107] Straight correlation of a certain measure with the goal of the company is not necessarily a quality indicator. When earnings per share (EPS), for example, are highly correlated with the share price, it does not necessarily imply that it is a good measure of performance. If both measures are hit by business cycle variations, with similar noise terms, the correlation is high, even though paying based on EPS creates a distorted incentive to increase the share price, because EPS ignores long-term effects. In short, a performance measure is valuable if it induces valuable actions, not if it is highly correlated with the share price. Therefore alignment is more important than influence.

[108] Core, Guay and Verrecchia (2003) summarise two key predictions of the accounting literature concerning performance measures: (a) the relative weight on a given performance measure is a decreasing function of the noise in the performance measure, and (b) the relative weight on two performance measures is a decreasing function of the relative noise in the performance measures.

convex or concave (Holmstrom and Milgrom (1987). Non-linear plans tend to reward gaming and/or performance volatility. When contracts are linear and constant across periods, managers have fewer incentives to adjust effort based on year-to-date performance or to shift earnings across periods to maximise current bonuses. Decisions that increase current earnings at the expense of future earnings will have a symmetrical consequence for future bonuses; ii) Objective performance measures typically cannot be used to create ideal incentives. Baker, Gibbons and Murphy (1994) show that subjective performance assessment can increase the efficiency of compensation contracts by subjectively blacking out noise, or increase alignment in imperfect objective performance measures;[109] iii) Efficient bonus rates are typically small, as there is no sense in creating strong incentives for the wrong actions; iv) It is often helpful to use multiple instruments to provide a balanced package of incentives, i.e. trade-off between risk and distortion.

Multiple agents

In a multiple-agent setting, incentive contracts can also take on several different forms based on the interaction between these agents. A special structure is the contract based on the tournament model, which can induce optimal incentives via the source of competition (Lazear and Rosen, 1981). Agents striving to win the 'corporate tournament' will exert additional effort as long as the prizes are high enough (Rosen, 1986). When workers have the ability to negatively affect each other's output, it is more efficient to have weak incentives instead of strong but dysfunctional incentives (Lazear, 1989, Holmstrom and Milgrom, 1994). Tournament-like incentives are inherent to most organisations through promotion to different ranks in the organisation. Within this theory, CEO compensation that seems out of proportion ex post, inefficient, or not in line with the marginal product, can be efficient if it induces ex ante efficient incentives.

Multiple periods

It is important to note that incentive contracts are not the only source of incentives. Incentives can also arise from career concerns (Fama 1980, Holmstrom 1982b). Career concerns arise in situations in which the agent exerts effort not only to maximise current pay but also to affect the perception of others. Since the worker's current performance affects the market's belief about the worker's ability, it will affect future career opportunities and thus the worker's future

---

[109] The notion of subjective performance assessment has been picked up by corporate governance platforms in terms of assessing reasonableness of payments to executives. The Dutch Corporate Governance Code (2008) states in best practice provision II.2.10: "If a variable remuneration component conditionally awarded in a previous financial year would, in the opinion of the supervisory board, produce an unfair result due to extraordinary circumstances during the period in which the predetermined performance criteria have been or should have been achieved, the supervisory board has the power to adjust the value downwards or upwards."

compensation.[110] Gibbons and Murphy (1992) have added incentive contracts to the Fama-Holmstrom model, optimising explicit and implicit incentives. Generally speaking, because the implicit incentives related to career concerns are weakest for workers close to retirement, explicit incentives from the optimal compensation contract should be strongest for such workers.[111] In case of a CEO, he or she might care about post retirement opportunities and will therefore not be entirely driven by these explicit contractual incentives.[112] For younger workers, the career concerns theory indicates that no variable pay is needed to create incentives for effort. Variable pay, however, can still be useful to overcome an overly risk-averse attitude.[113] When parties engage in a long-term contract, a repeated open-ended relationship, other elements can also become important:

i) *Relational contracts*: Informal self-enforced provisions can supplement a formal court-enforced contract. When a credible future penalty in the event of non-compliance is in place, each party is induced to stick to the agreed term. An example of a relational contract is a promise of a bonus payment or a promotion as a reward for good performance. Most employment relationships have such informal provisions;[114]

---

[110] Dewatripont, Jewitt and Tirole (1999) extend the Holmstrom (1982b) career concerns model to a multitask environment. The study shows that optimal contracts should take into account which performance variables are particularly interpreted by the market as a proxy for 'ability'. If these are not taken into account, agents may exert too much effort to those tasks and too little to other important tasks that the market uses, to a lesser extent, to update beliefs of managerial ability.

[111] Surprisingly, the related 'horizon problem' has not been supported by strong empirical evidence. The 'horizon hypothesis' claims that CEOs near retirement should be rewarded more with share-based vehicles such as share options. This would also reward him or her for decisions that generate positive net cash flows after his or her retirement. The theory thus predicts a positive relationship between equity-based compensation and age. An overview based on selected empirical research papers yields only one study that supports this theory, Lewellen, Loderer and Martin (1987), and four that even found a negative relationship; Ryan and Wiggens (2001), Hwang and Lilien (2000), Yermack (1995), Eaton and Rosen (1983).

[112] Brickley, Linck and Coles (1999) show that these opportunities are positively related to the executive's performance during the final years of employment, based on a sample of 277 CEOs leaving office in the period from 1989 to 1993 from Fortune 500 companies. Abnormal share returns in the final two years of a CEO's tenure are particularly important in explaining the CEO's continued service on his own board. The likelihood of serving as an outside director on other companies' boards is better explained by accounting returns over the CEO's tenure, than by share returns.

[113] Empirical research underlines the complexity of trading off explicit and implicit incentives. Nohel and Todd (2005) studied the problem of compensating a manager whose career concerns affect his investment strategy. The change in the manager's human capital is proportional to the change in firm value. The principal's problem is to find the most cost-efficient way to overcome the manager's excessive conservatism, either by insuring the manager's human capital risk or by introducing a compensation contract whose payoff is convex in firm value. The optimal contract arising from this situation is a fixed salary, paid out in cash, supplemented by a small number of call options. The option's convex payoff function helps to overcome managerial risk aversion. Options will be granted 'at the money', i.e. the intrinsic value will be low or zero if the manager shies away from risk. The greater the career concerns, the more options need to be granted to encourage risk-taking behaviour.

[114] Brown, Falk and Fehr (2004), for example, show that long-term relational contracts can provide significant gains for both parties in the relationship. Successful long-term relationships exhibit generous rent sharing and high effort and quality from the very beginning of the relationship. Between firms and

ii) *Contract renegotiation*: Long-term contracts can often be re-negotiated at a later stage. Ex post renegotiation can undermine ex ante incentives. The issue of re-pricing share options provides an example relating to executive compensation. The resetting of the strike price to a lower level after options 'drop out of the money' benefits the company by restoring incentives ex post, but the anticipation of such moves undermines ex ante incentives;[115]

iii) *Wealth effects*: In a general multi-period setting, wealth effects should be taken into account. Wealth can change the risk preference of an individual; generally, the more outside wealth the less risk averse,[116] and therefore the slope of the optimal contract will often be a non-linear function of the history of output. Furthermore, a general insight from long-term contracting is that it is in the principal's interest to force the agent to consume more in earlier periods and reduce savings. By keeping the agent's continuing wealth low, the principal can ensure that the agent's marginal utility of money remains high. The principal can hereby reduce its costs by providing the agent with effective monetary incentives.

Figure 2.11: Overview agency literature – panel C

Advanced moral hazard problem – incomplete contracts.

Basic problem:	**Multidimensional problem:**	**Advanced problem:**
■Uncertainty & asymmetric information	■Uncertainty & asymmetric information	■Uncertainty & asymmetric information
■Complete contracts	■Complete contracts	■Incomplete contracts
■Single task	■Multiple tasks	■Observable but unverifiable information
■Single agent	■Multiple agents	■Multi-dimensional aspects
■Single period	■Multiple periods	

Level of sophistication – more in line with real life circumstances →

workers, the average income of both parties is much higher than in the short-term, court-enforced relationships, as workers provide higher effort levels to receive higher wages. A firm can initiate a trustful long-term relationship by already paying relatively high wages at the beginning of the relationship, and the worker can signal that he or she can be trusted by providing effort that meets or exceeds the firm's expectations.

[115] Papers researching the issue of re-pricing in real world cases are, for example, Brenner, Sundaram and Yermack (2000), Chance, Kumar and Todd (2000), Chidambaran and Prabhala (2003), and Carter and Lynch (2001). Re-pricing is not very frequently observed. It is seen especially in companies that face negative shareholder returns operating in the high-tech or services sector. A typical downward adjustment equals 40%, restoring the exercise price to a level that is 'at the money'. Note that, according to Acharya, John and Sundaram (2000), re-pricing of share options is not always suboptimal. It can result in an increase in the value of the organisation when the positive incentive effect of re-pricing is stronger than the negative effect on the initially provided incentive, all observed from an ex ante viewpoint. Furthermore, Balachandran, Carter and Lynch (2004) report that companies respond to underwater options not only by re-pricing, but also by increasing total compensation, salary and share option grants, primarily in an attempt to retain executives and restore incentives.

[116] Becker (2006) studied the wealth of Swedish CEOs. Higher-wealth CEOs were found to receive higher incentives, consistent with the prediction of agency theory that, as a result of higher non-firm-related wealth, lower absolute risk aversion results in the possibility of providing stronger incentives.

Figure 2.11-C shows that the advanced problem of moral hazard also deals with multidimensional problems. However, the separation of ownership and control, as identified by Berle and Means (1932), and the associated pursuit of managers fulfilling their own objectives is only one aspect that shapes the contracting relationship. According to Bolton and Scharfstein (1998), standard agency theory, and its implications for optimal contracts, suffers from an excessively narrow view of the firm. In their paper, they advocate integrating this view of the firm with the question of Ronald Coase (1937): "Why are there firms?", which is concerned with the question of integration. Firms emerge in response to the inefficiencies arising from being unable to write contracts that fully specify what should happen in future situations that are hard to foresee or describe. The difficulties relating to such incomplete contracts affect the owner-manager relationship and are discussed below.

Incomplete contracts

Theoretical research on incomplete contracts is a relatively new phenomenon when compared to the complete contracting framework. According to Hart (2001), economists use the term 'incomplete' to refer to a contract that does not set out all the future contingencies, or which fails to specify the obligations and benefits of the exchange partners under each possible contingency. The key test of contractual incompleteness, according to Jacobsen and Skillman (2004), lies in the possibility of specifying the terms and conditions of exchange in such a way that failure to achieve them can be verified by an external enforcement agency. Contracts are deemed complete so long as all matters affecting the potential gains from trade that are observable to the trading parties can also be verified by the appropriate external enforcement agency, such as a court of law, and are rendered incomplete to the extent that this condition does not hold. Tirole (1999) states that incomplete contract models are usually associated with transaction costs and one or more of the following ingredients: i) *Unforeseen contingencies / bounded rationality:*[117] Parties cannot define, ex ante, the contingencies that may subsequently occur, or actions that may become feasible later on. So they must content themselves with signing a contract, such as an authority or ownership relationship, which does not explicitly mention those contingencies, or by not signing a contract at all; ii) *Cost of writing contracts*: Even if one could foresee all possible events, they might be so numerous that it would be too costly to describe them in a contract; iii) *Cost of enforcing contracts*: Courts must understand

[117] Maskin and Tirole (1999) express the view that transaction costs relating to describing or even foreseeing future physical situations in advance need not interfere with complete contracting. Transaction costs need not be relevant, provided that agents can forecast their possible future pay-offs, even if other aspects of the physical situation cannot be forecasted. They invoke the irrelevance theorem and state that, if parties have trouble foreseeing the possible *physical* contingencies, they can write contracts that specify only the possible ex ante *payoff* contingencies; after all, it is payoff that ultimately matters. Complete contracting should thus not be dismissed too quickly.

the terms of the contract and verify the contracted contingencies and actions in order to enforce the contract. If this cannot be done, the contract is said to be incomplete.

A key question that arises with respect to incomplete contracts is: how are future decisions taken? Given that an incomplete contract is silent about future eventualities, and given that important decisions must be taken in response to these eventualities, how will this be done? What decision making process will be used? Asking these questions implies a fundamental shift of focus. The focus of the optimal contracting paradigm was on constructing compensation contingent upon performance results. Focus of the incomplete contracting paradigm is on procedural and institutional-design issues. It does not explain the form of the contract as the outcome of some optimisation problem. It is the result of optimal institutional design, the design of decision-making rules, and the allocation of control rights.

There is a different view of the firm related to this shift away from standard incentive theory. Where Jensen and Meckling (1976) define the owner of the firm only in terms of cash flow rights, shareholders are the owners as they are the "residual claimant on the firm's *cash flow*", Grossman and Hart (1986) define the owners as having "residual rights of *control*". Grossman and Hart (1986) and Hart and Moore (1990), explore the issue of the value of ownership and residual rights of control in situations in which parties write incomplete contracts. In the property-rights theory of the firm, the owner has the specific right to exclude others from using the firm's assets. This right serves as a protection against ex post opportunism. In its simplest form, the theory predicts that ownership of productive assets is allocated to the party requiring the most protection against ex post opportunism.

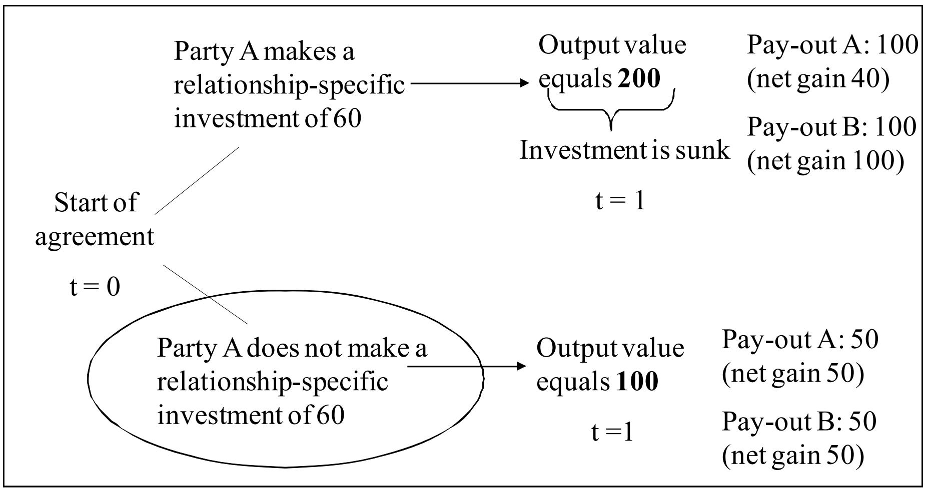
In reality there are wealth constraints, limiting the possibility of owning or even buying assets. The modern corporation is characterised by the separation of ownership and control. Aghion and Bolton (1992) have created a state-contingent control model in the case of a wealth-constrained entrepreneur. It answers the question of who should own the firm, i.e. the critical decision rights, given a wealth-constrained entrepreneur and a financier. Potential conflicts can be related to the fact that the manager likes other things besides money. The investor might be particularly interested in short-term gains and not put value on the company as a going concern. The allocation of control, defined as: who gets to make the critical decision, is thus an important dimension of the financial contract. State-contingent control, in which the manager-entrepreneur controls the company when it performs well, and the investor controls the company when it performs poorly, appears to be an efficient system. The model of contingent control is most directly applicable in a venture-capital setting. Kaplan and Strömberg (2003), researching 200 venture capital deals, indicate that cash flow rights are generally allocated separately from voting or board rights. Future control rights are often contingent upon observable measures of firm performance. Generally, the venture-capital lead partner obtains full control if the firm performs poorly, whereas, if the firm performs well, the entrepreneur can increase his or her control rights.

In large listed firms, managers often have no or very little residual control rights, and at first sight seem to be only a small part of the entrepreneur-investor game of Aghion and Bolton (1992). After all, one could argue that state-contingent control applies only among financial claim holders. In bad states, *creditors* have control, and in good states of the world, *shareholders* have control. Since large firms are financed by large amounts of capital, management in these firms can generally not obtain bargaining power via actual ownership rights.

The related problem arising in this employment relationship is the so-called hold-up problem. This problem can be illustrated, based on a simple production agreement between two parties A and B, in which party A needs to make a relationship-specific-investment in human capital to raise productivity and thus the outcome of the production agreement. Suppose all payments to the parties are obtained from the realised value of the final output, and the investment of party A is not verifiable for a court, e.g. it is an intellectual investment. When parties cannot credibly agree not to renegotiate ex post, after the investment has been made, a hold-up problem can arise. Figure 2.12 provides a graphical representation of the hold-up problem.

Figure 2.12: Relationship-specific investments and the hold-up problem

In this figure the hold-up problem is reflected. Party A chooses not to make a (socially desirable) relationship-specific investment (is held up) as he anticipates a net gain of 40 instead of 50. As a result, the total net gains from the production relationship are reduced (from 140 to 100).



At t =1 (ex post situation) the investment of party A is sunk. Once it is sunk it creates quasi rents, which are amounts in excess of the return necessary to keep the invested assets in their current use. In figure 2.12, this amount is 100 (200 minus 100).[118] Under equal ex post bargaining rights, the relationship-specific investment will be given up. The social costs of contractual incompleteness thus depend in part on the determinants of bargaining power over quasi rents. In the case of companies, Holmstrom and Roberts (1998) have shown that most hold-up problems can be solved through integration of activities.

This is not the case with the hold-up problem in the labour relationship between a CEO and the company owners. The previously-mentioned logic of state-of the world-contingent control can be a solution and is translated into certain types of incentive plans. One could, for example, argue that 'performance share plans',[119] which allocate shares to the CEO and/or Board of Management when the company has performed well, resemble a form of mitigated state-contingent control. Although the allocated control rights after good performance might only be a small part of total control rights, management has additional bargaining power resulting from the undertaken relationship-specific investments. The threat of quitting, thereby reducing the returns of these investments for the shareholders of the company, provides additional control (Duffhues, 2000 and Zingales, 2000).[120]

In summary, the incentive problem is twofold:

1. The traditional agency problem, as a result of the separation of ownership and control: discouraging empire building and shirking, and thus providing incentives for effort and appropriate risk taking: making the right, sometimes risky, investments;
2. The human capital under-investment problem: providing incentives to undertake firm-specific investments in human capital that benefit both the agent and the principal. This incentive problem, as mentioned above, could be solved in part by allocating ownership rights, i.e. shares,[121] to ensure the CEO will receive his or her share of future payoffs.

---

[118] There are also pure rents, which are returns in excess of those needed to cause the investment to be made in the first place. In figure 2.4, this amount is 40: 200 minus 100 minus 60.

[119] Performance share plans, as well as performance option plans, are common among the larger listed companies in the Netherlands. This is partially the result of the introduction of the Dutch Corporate Governance Code (2003, 2008), which advocates that shares should only be granted after the achievement of clearly quantifiable and challenging targets (BPP: II.2.3).

[120] Shleifer and Vishny (1997) therefore argue that outside financiers should be protected against expropriation through the residual right of control.

[121] Holmstrom and Roberts (1998) stress that asset ownership is not the only source of bargaining power. Other incentive instruments, such as relational contracts and other substitutes for ownership, are available to deal with the joint problem of motivation and coordination. Duffhues (2000), for example, describes the role of executive share options in overcoming under-investment problems arising from incomplete contracts.

We have observed the paradox that the second incentive problem is partly solved by the existence of the first. The modern corporation is characterised by the separation of ownership and control. In view of the fact that shareholders are dispersed, it is mainly managers who control the company.[122] This fact, the ability to derive individual benefits typically referred to as agency costs, thus also has a positive side effect; it provides an incentive to invest in firm-specific human capital.

2.4.4 The role of the remuneration committee

The task of the remuneration committee is to adequately trade off fixed versus variable compensation, risk versus distortion, over-investment versus under-investment, objective versus subjective performance measures, explicit incentives versus relational-, reputation- and career-concerns, etc. Trade-offs should be made in light of the corporate objective function: enlightened value maximisation creating long-term shareholder value (Jensen, 2001).

The most comprehensive trade-off in designing the compensation contract is the one between risk and distortion. Organisations rarely have low risk as well as low distorted performance measures and remuneration vehicles, and therefore choose a combination from the categories 'low risk and high distortion' or 'high risk and low distortion' from table 2.20.

Table 2.20: classification of performance measures and compensation vehicles (risk and distortion)

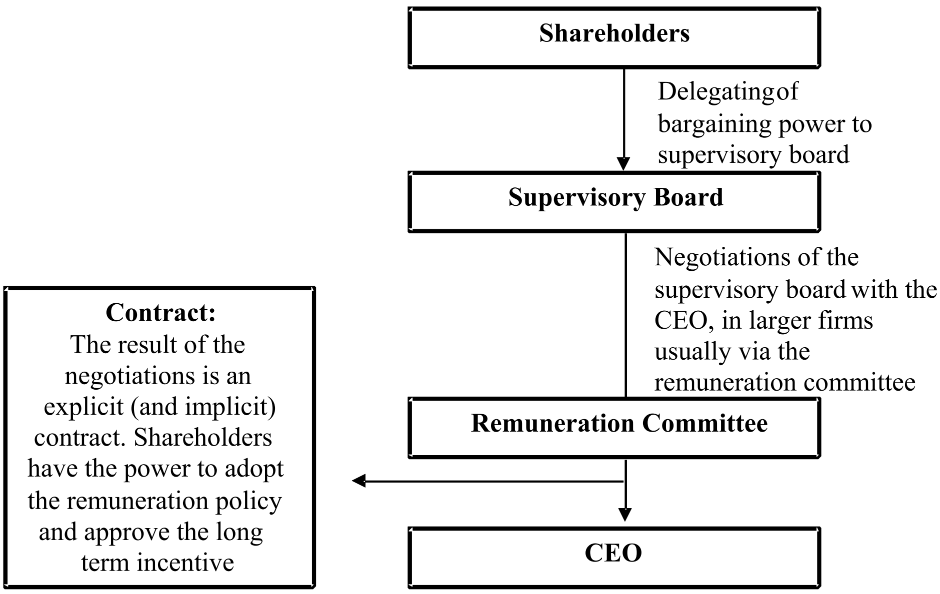
Low risk - high distortion	High risk - low distortion
Short-term focused performance measures	Long-term focused performance measures
Individual performance measures	Group performance measures
Accounting/internal based performance measures	Value-based/external performance measures
Relative performance measures	Absolute performance measures
Multiple measures	Single measure
Cash-based vehicles	Equity-based vehicles

[122] Zingales (2000) provides an excellent example of the difference between ownership and control, especially in 'new firms', which are characterised by human-capital-intensive operations and a highly competitive environment. The shareholders of the advertising agency Saatchi and Saatchi thought that, as they owned the firm, they also controlled the firm. After voting down a generous option package for the chairman following bad company performance, the latter left the company, and took with him quite a few key executives. This resulted in significant destruction of human-capital and other value caused by shareholders exercising their traditional ownership rights.

Note that table 2.20 also provides insight into the 'perceived value'[123] of compensation instruments. Perceived value could be defined as the certainty-equivalent cash amount that the executive would be willing to give up in exchange for the risky award. Generally, the higher the risk, the lower the perceived value is, assuming a risk-averse agent. Combinations of items from the left-hand column of table 2.20 generally have a higher perceived value than combinations from the right-hand column. For example, a yearly cash bonus based on an internal measure of individual performance has a higher perceived value than a long-term-performance option plan based on the achievement of an absolute Total Shareholder Return (TSR) hurdle.

The real life complexity of making the previously mentioned trade-offs is not a sinecure. The relatively stylised world of the agency model is replaced by the setting as reflected in figure 2.13.

Figure 2.13: CEO contract bargaining in a Dutch firm with diffuse ownership



The following factors add complexity: i) There are multiple agency problems: between shareholders and management, between the compensation committee and shareholders,[124]

[123] Perceived value research has particularly focused on share options. These equity vehicles generally have a low perceived value relative to company costs, as a result of the fact that managers are undiversified, effectively risk-averse, and exposed to the firm's total risk, but only rewarded for the systematic part. See Hall and Murphy (2002) and Meulbroek (2001).
[124] Bebchuk, Fried and Walker (2002) and Bebchuk and Fried (2003, 2004) focus on the assumption that the compensation committee will not always be a perfect agent for outside shareholders. Diffuse ownership would not result in arm's length bargaining. This would cause inefficient incentive contracts

between current and future shareholders;[125] ii) There are multiple principals within the same 'group of principals', focused on shareholders in this case, with different objectives residing in different countries, e.g. pension funds, venture capitalists, small shareholders, etc., from the Netherlands or abroad;[126] iii) Different contexts due to differences in corporate governance, legal system, tax system accounting rules, can result in different results, i.e. context is relevant; iv) Economic as well as social factors play a role: maximising utility includes not only economic, but also social elements, such as balancing compensation-related decisions with potential outrage costs, status, etc. Furthermore, the 'logic of appropriateness' in practice sometimes dominates relative to the 'logic of consequence', i.e. the underlying 'model of man' is relevant, as describe below.[127][128]

---

characterised by camouflaged performance insensitivity only constrained by outrage costs, which are economic and social costs that executives and non-executives bear as a result of designing and approving a pay package that is perceived as 'outrageous' by stakeholders of the company.

[125] A situation of conflict between current and future shareholders could arise by relaxing the assumption of Holmstrom and Tirole (1993), in which the share price would be an unbiased estimator of firm fundamentals, and allows for the possibility of overvalued equity, Jensen (2004, 2005). Bolton, Scheinkman and Xiong (2006) developed a model dividing the share price into a long-term fundamental value and a short-term speculative component. From the perspective of current shareholders, an optimal agency contract would be to provide the CEO with incentives to exacerbate investor's differences of opinion and to bring about a higher speculative share price, possibly at the expense of collapsing the company in the future.

[126] A shareholder base is not homogenous. Investors do not all share the same beliefs on future cash flows of the company or the appropriate discount factor, nor do they all have the same objectives; compare hedge funds with yield investors, core growth investors, etc. Differences can also be observed when looking at voting behaviour in light of executive compensation plans that are put up for approval. Morgan and Poulsen (2001) and Morgan, Poulsen and Wolf (2006) show that not all investors vote in the same way, and that behaviour changes over time; comparing the latter with the first study, investors have become more sensitive for potentially harmful provisions.

[127] For example, if the manager-shareholder relationship can be characterised as a stewardship relationship instead of an agency relationship, different types of contracts would be optimal. Stewardship models assume behaviour characterised by pro-organisational collectivistic behaviour, e.g. Davis, Schoorman and Donaldson (1997a, b), McConvill (2005). Fixed compensation could be a viable alternative, possibly in combination with shares with long lock-up periods to rationalise relationship-specific investments. Note that the stewardship model creates a prisoner's dilemma. Adopting a stewardship contract in which the manager eventually will behave as an agent would be analogous to turning the hen house over to the fox.

[128] Jensen and Meckling (1994) adopt a more comprehensive model of human behaviour. According to their model, people are driven by tangibles, i.e. wealth, as well as intangibles, such as leisure, but also respect, honour, power companionship, self-actualisation and the welfare of others. They furthermore have a positive rate of discount for future as opposed to present goods, which can explain fraudulent behaviour. People will respond creatively to the opportunities the environment presents to them, and they will work to loosen constraints that prevent them from doing what they wish. Trade-offs can be made between the various human needs (to a certain extent). The model thus deviates from the psychological model of Maslow (1943), in which human needs are arranged in hierarchies; the appearance of one need usually rests on the prior satisfaction of another more compelling need. From high to low, these needs are: physiological, i.e. water and food, safety, love, and self-actualisation. In Maslow's model, no amount of safety will be traded for any amount of food, until the latter need is satisfied.

Logic of appropriateness

The 'logic of consequence' underlying the agency theory can limit our understanding of the executive compensation landscape if decision-makers actually apply a different decision-making scheme. The latter seems plausible, since all individuals are constrained in their capacity to make fully rational decisions, due to the cost and sometimes unavailability of information, and because of their own cognitive limitations. Decisions in practice are typically based on factors such as norms, i.e. market practice, corporate governance best practices, and trust, culture,[129] recommendations, rules, history and authority. The model of decision-making that is in line with this is called the 'logic of appropriateness' (Cyert and March 1963/1992). The logic of appropriateness is a perspective that sees human actions, as driven by rules of appropriate or exemplary behaviour, organised into institutions. Instead of searching for a maximising situation, decisions are made because they are seen as natural, rightful, expected, and legitimate.

Institutions constrain decision-making by defining and limiting the set of choices individual actors have (North, 1990). Maps of bounded rationality are provided by research of Daniel Kahneman and Amos Tversky. These maps of bounded rationality for example relate to the heuristics that people use (Kahneman and Tversky, 1973; Tversky and Kahneman, 1974) decision-making under uncertainty (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992; Kahneman et al. 1990, 1991; Tversky and Kahneman, 1991) and framing effects with their implications for rational-agent models (Tversky and Kahneman, 1981, 1986).

Bounded rational behaviour, e.g. of the compensation committee, is observed in practice, for example, in the case where simplicity is defined as a guiding principle, not fully understanding the full cost and effects of certain remuneration instruments,[130] following market practice, i.e. what other companies do, instead of developing a tailor-made plan, etc. If the remuneration committee is not able to oversee all possible consequences of its remuneration decisions, a 'dark side of executive compensation' also arises. This 'other side of the trade-off' is not always adequately taken into account, given the results of various empirical studies with a common denominator: when there is too much at stake, this can result in counterproductive behaviour, as

---

[129] This relates to national culture as well as to the culture within the organisation. Tosi and Greckhamer (2004), for example, show that CEO pay is characterised by power, distance, and individualism: compare France and U.S. versus Sweden and Japan.

[130] For example: according to Murphy (2002), the perceived costs of share options were low in the 1990s, partially because options were not expensed in the profit and loss account. This led to granting too many share options to too many people, the so-called 'option explosion' in the U.S. in the 1990s; also see Jensen, Murphy and Wruck (2004).

indicated by, among others: Denis et al. (2006), Cullinan et al. (2006), Goldman and Slezak (2006), Jensen (2004, 2005), Efendi, et al. (2004), Tian (2004).

2.4.5 Summary and conclusion

This section has focused on the dynamics of the executive *remuneration structure* decision. Based on an overview of agency (contract) theory, it has become clear that the 'principal's problem' involves various trade-offs resulting in different optimal results within different organisations. The role of the remuneration committee is to strike a balance between security and risk, line of sight versus goal alignment, over-investment versus under-investment, objective versus subjective performance measures, explicit incentives versus relational, reputation and career concerns, etc. Furthermore, process, context and the underlying model of man are relevant. Additional variation can therefore be explained, by the different design of institutions. A contingency approach is needed to understand which elements are most influential in which circumstances. Section 2.5 will summarise the building blocks into an eclectic perspective that helps to understand how the remuneration policy is determined in practice.

2.5 The executive remuneration decision

The previous two sections have provided theoretical anchor points linked to the context of executive remuneration in practice. When remuneration falls apart in level and structure, section 2.3 has provided insight into the ex ante *level* of compensation and the price of human capital in the executive labour market. A number of characteristics of the executive labour market were described and it was concluded that demand and supply curves intersecting in this market can only partially explain the ex ante price of human capital. Since the market is imperfect, relative to the other observed markets, i.e. the share market and the labour market for manufacturing employees, the remuneration committee enjoys quite some flexibility in setting a CEO's pay package.[131] The *structure* of a compensation package, especially variable pay, and the associated ex post level of compensation were discussed in section 2.4. Assumptions usually underlying a standard agency setting, in which a representative shareholder contracts with a CEO based on maximising economic utility functions, are not always fully met in practice, and therefore cannot completely explain the executive compensation landscape.

This section further dissects the executive compensation decision in reality, and combines the building blocks of the previous sections into an eclectic perspective. It consists of four lenses and may serve as an aid to improve future empirical research and to better interpret past empirical research. The section is structured as follows:

Remuneration level – ex ante (see section 2.5.1) which relates to the expected value of total direct compensation, i.e. the sum of basic salary, target bonus and the fair value of the long-term incentive component;

Remuneration structure – ex post (see section 2.5.2): which relates to the way the compensation package is structured. The structure of pay in combination with the actually achieved performance results in ex post compensation;

Constraints of the remuneration committee (see section 2.5.3): which describes the pivotal role of the compensation committee as the spider in the executive compensation web but also the constraints it faces;

Categorisation of the remuneration committee (see section 2.5.4): The characteristics of the committee contribute to the explanation of the remuneration policy outcome.

---

[131] Gomez-Meija and Wiseman (1997) observe significant variation in the salary, bonuses and long-term incentive income received by executives of firms of similar size, in the same industry, and performing at similar levels, and conclude that there is thus room to manoeuvre.

2.5.1 Remuneration level – ex ante perspective

Determining the policy level

The first building block of the remuneration policy entails the total remuneration level. The typical total remuneration package entails the following components (Towers Perrin Worldwide Total Remuneration survey 2005-2006): i) Annual basic salary, including regular payments such as 13th month salary and vacation allowance; ii) Variable bonus: payment related to (individual) performance; iii) Long-term incentive: annual expected value of long-term incentive awards, such as share options and share grants; iv) Benefits, including compulsory company contributions, such as social security expenses and voluntary company contributions, such as pensions and medical (insurance) contributions; v) Perquisites, including the annual cash value of the company car and club memberships.

Below, the process of setting remuneration levels is further explained. The focus will be on the direct remuneration elements, i.e. the basic salary, annual bonus and long-term incentive. Benefits and perquisites typically comprise a smaller portion of the remuneration package of a CEO in a given year, with variation especially depending on the country-specific context. The objective is to provide insight into the steps that are taken in a typical pay-setting process in practice.

In the typical process of setting remuneration levels for the CEO, the remuneration committee proceeds through the following steps:

1. Determine a labour-market peer group based on a number of selection criteria;
2. Collect market compensation data of these companies;
3. Determine which market reference will be relevant, e.g. lower quartile, median, upper quartile;
4. Discuss the external reference as well as other relevant input parameters, such as the internal reference, political climate, public opinion, etc., in the remuneration committee;
5. Set policy level and actual pay level, based on steps 1 to 4, and implement this.

Step 1 – labour-market peer group

From practical experience, all large listed companies use external compensation references to determine compensation levels. Some companies rely more heavily on this kind of data, while others use it as one of the input factors in the pay-setting process. The Dutch Corporate Governance Code (2003, 2008) requires listed companies to include, in its remuneration report, if applicable, “the composition of the group of companies (peer group) whose remuneration policy determines in part the level and composition of the remuneration of the management board members".

When the remuneration policy is under review in a typical process, first a labour-market peer group is established. If possible, one labour market for the full executive board is established. Executives from the United States are often ring-fenced and compensation is based on the U.S. market.

Based on a number of selection criteria, peer companies are chosen. Selection criteria can include for example: i) From which companies does the company hire executives and to which companies does it risk losing executives, based on past experience and outlook for the future?; ii) Same sector, or cross industry?; iii) Complexity of the business; iv) Comparable scope figures, e.g. revenues, market capitalisation, employees; v) National, Dutch, or also foreign companies?; vi) Justifiable to stakeholders.

In terms of compensation levels, an important decision is whether to choose only national companies or to select foreign companies as well; practices in various countries have been reflected in section 2.2. For example, adding U.S. companies to the peer group will often increase the observed market level. Therefore all criteria ultimately need to be reconciled with the final criterion: 'justifiable to stakeholders'. It is important to note that 'outrage costs' (Bebchuk and Fried, 2004) seem to play a role in this process. Remuneration committee members are reluctant to approve compensation packages that could be perceived as 'outrageous', as a result of the fear for reputational damage.

Step 2 – data collection

After an appropriate labour-market peer group has been established, a benchmark is performed. Benchmark figures are usually obtained via compensation consultants, such as Hay Group, Mercer, Towers Watson, etc. These companies provide market figures for the selected group of companies, usually for the lower quartile, median, and upper quartile levels. Market figures either reflect raw data, or are regressed to reflect the size and scope of the company.

Step 3 – relevant market reference level

The remuneration committee sets a relevant market reference level. A market-competitive level is typically referenced to the median market level (50^{th} percentile). Companies who set their reference level higher than the median market level often justify this based on the 'desire to only hire the best executives in the market'.[132]

Step 4 – discussion

The defined reference market and desired pay reference level are the starting points for a discussion in the remuneration committee. Other relevant input parameters include:

i) *Internal equity considerations*: desired pay difference between the CEO and the other board members, desired pay difference between the board of management and one level down in the organisation, if considered appropriate, the pay-relativity between the CEO and the average or lowest paid employee of the company is determined;

ii) *Political and social climate*: in the year 2004, for example, it was difficult to justify base pay adjustments of management-board members in the light of the 'social agreement' (*Sociaal Akkoord*). Outrage costs and camouflage as defined by Bebchuk and Fried (2004) can play a role in this respect. In this light, decisions can be made to not adjust the basic salary, because it is highly visible and therefore might cause public scrutiny. A possible desire to adjust pay could result in adapting other components such as the long-term incentive component, which is less visible;

iii) *Pay mix*: ratio of fixed versus variable; within the variable part of remuneration: the ratio of short-term versus long-term oriented compensation. The first mentioned 'internal equity consideration' in fact represents elements of the tournament model as discussed in section 2.4. The price of winning the 'corporate tournament', i.e. becoming CEO, is only worth providing additional effort for as long as the price is high enough. The pay mix can be the result of following the market reference or a more fundamental decision, for example, based on the nature of the business or the strategic focus. In a going-concern situation, the company ought to have more focus on the longer term than on the short term. The pay mix can differ per board member.

Step 5 – determination of policy level and implementation

The final step is to formalise the choice for a certain compensation level in the remuneration policy and ask shareholders to adopt the new policy, in the Dutch situation. At a certain moment

[132] Engesaeth (2006) indicates that setting pay above the market median could result in 'pay ratcheting'. As peer groups have an absolute ceiling, this effect is limited to this ceiling and does not result in ever-increasing pay levels. The latter effect, however, *is* observed when going-concern companies compare themselves to organisations that raise the market ceiling, a company in financial distress, for example, that pays an additional risk premium.

in time, there can be a difference between the *policy* ex ante compensation level and the *real* ex ante compensation level. Different companies deal differently with such an issue. If the compensation committee, for example, decides that the relevant pay level for the CEO is the median of a defined reference market, and the current compensation package of the CEO is situated below this level, the committee can decide to increase the level in the given year or to apply a growth scenario in which policy levels are met within, for example, two or three years.

Hiring executives – bargaining process

The process described in the previous sections is relevant for situations in which there is no vacancy on the board of management. Regular compensation adjustments, if applicable, can be based on the defined policy. However, a negotiation will take place when a new management board member is hired. This process has been discussed in section 2.3.4. As mentioned previously, due to imperfections, and potential inefficiencies, it is unlikely that all CEOs will be paid the unbiased value of their marginal product. Jensen, Murphy and Wruck (2004) even state that remuneration committees almost consistently pay too much for newly appointed CEOs, especially those hired from outside the firm, since the pay bargaining process starts when the pool of candidates is narrowed down to one, which shifts the bargaining power to the candidate. Gomez-Meija and Wiseman (1997) also state that the firm enjoys much flexibility in deciding on a particular CEO's pay package, given the huge variance in the salary, bonuses, and long-term incentive component received by executives of firms of similar size, in the same industry, and performing at similar levels.

Eclectic perspective – lens 1: policy level

The first lens summarises the way policy level is determined. The remuneration committee collects the necessary external and internal data to set compensation levels. The market is effectively translated into a reference group, on the basis of which remuneration levels are set. The internal reference and/or tournament objectives are taken into account. Policy levels are eventually set based on this information, as well as other information deemed relevant by the remuneration committee, i.e. tax treatment, etc.).[133] Figure 2.14 illustrates the setting of policy levels:

---

[133] Note that the performance level does not directly play a role in setting the ex ante compensation level. After all, it reflects the value of compensation under the assumption of expected or at target performance. Indirectly, performance may play a role, as a compensation committee might be more willing to adjust or increase ex ante compensation in a given year if the performance of the company has been very good; if this is the case, the outrage constraint is loosened, as shareholders will be less inclined to scrutinise executive compensation when the performance of the company is excellent.

Figure 2.14: Setting policy levels in practice – flow of information

In a final discussion within the remuneration committee, decisions are made. Eventual decisions are based on:

i) *The judgement of the remuneration committee*: this is based on the collected information, the characteristics of the person in the CEO position, the difference in terms of complexity of the role versus the same position in companies of the comparator or peer group, etc. This judgement is affected by the personal anchor points of the committee member, such as individual characteristics, their past or present position as management board member, the degree to which the compensation committee members are effectively influenced by the management of the company, individual belief about what is a reasonable pay package, balance of power within the remuneration committee, etc.;

ii) *The (outrage) constraints*: this limits the action space of the compensation committee. For example, there are three compensation committee meetings in a specific year. During the first two meetings it was decided that a certain remuneration level would be appropriate considering the competitive market. In the final meeting, it is discussed whether this is also justifiable to various stakeholders, in view of the political and/or social climate, performance of the company, etc. If this is not the case, this is often taken into account. Heineken N.V. provides an example. Heineken withdrew their proposals for a new remuneration policy shortly before the AGM of 2009 on the basis of stakeholder scrutiny. The remuneration committee is furthermore constrained by the rest of the (supervisory) board, shareholders, and all other parties that can legally constrain or effectively harm the company or its reputation. This will be further discussed in section 2.5.3.

In spite of various constraints, the remuneration committee still has room to interpret market and other data and manoeuvre within a certain bandwidth, which could result in optimal or less optimal results, given bounded rationality and/or logic of appropriateness. Table 2.21 provides examples of potential issues.

Table 2.21: Suboptimal ex ante compensation – normative check list

Element	Context
External reference	1. The companies chosen in the peer group could be an inadequate reflection of the relevant labour market for the specific company: a. Type of companies: is the company competing for talent only within a certain industry, or can a wider market reference of cross-industry companies be used? b. Geographical spread: is the company competing for talent within the country, in Europe, or even on a worldwide basis? If and when companies from the U.S. are included, the company would need to have a solid business case to prevent from being accused of driving up pay. 2. The peer group may be too small to robustly capture the relevant segment of the executive labour market. A peer group which has a relatively small number of constituents also results in: a. Volatility in the market reference: year-on-year changes can be the result of individual peer CEOs retiring or being replaced. This fundamentally hurts the theoretical principle of the perfectly competitive market, that a single market participant cannot affect the market price, because the market is proxied by the peer group; b. Noise: the small peer group could be an imperfect proxy for the relevant executive labour market segment. 3. Market data, if regressed, might be regressed based on the wrong elements. Should market data be regressed based on (log) revenue, market capitalisation, assets, etc.? If possible, the compensation committee should work with un-regressed market data, based on a peer group that is of similar size, scope and complexity as the company, to diminish 'noise' as a result of regression. 4. Noise can also be a result of the fact that there are different views on how long-term incentive grants should be valued. IFRS 2 has provided guidance, but there is still room for interpretation. With regard to relative TSR share plans, for example, a fundamental difference is whether or not to take the correlation into account between the number of shares that vest at the end of the performance period and the share price at that moment (P3xQ3 or P0xQ3). Both valuation methods are observed in practice and approved by external auditing firms; however, a significant difference in the fair value between different companies is the result. 5. When a market reference level is chosen above the 50^{th} percentile, the median of the peer group, this contributes to the so-called pay ratchet effect, within the range of market figures provided by the peer group.
Internal reference	6. The internal reference should be carefully considered. Are all executives below the board of management part of the corporate tournament or not? The effect of importing pay differences should be carefully dealt with. When acquiring a U.S. company, for example, creating a situation in which executives below the board earn more than a board member may cause an upward pressure on board of management pay. In this light, it is also important to ask who is part of the corporate tournament and who is not.
Other data and information	7. If and when an ex ante compensation level is based, or partially based, on other data and information, the company should carefully explain what this is and how it has affected the compensation levels.
Pay mix	8. With regard to the pay mix, the short-term incentive part should not be overemphasised. Multitasking models have shown that creating incentives for one task diverts attention away from other tasks. In a going-concern firm, therefore, the long-term component should have a higher weight than the short-term component.

2.5.2 Remuneration structure – ex post perspective

In section 2.4, incentive contracts were discussed. The shape of the contract, in combination with the eventual delivered performance, results in actual or ex post compensation. In the end, executives are interested in their actually earned compensation. An often-heard example in boardrooms, to emphasise this, is related to options. Once they are underwater, they are perceived as worthless, and often a disincentive. The way compensation is structured is therefore important, as it influences the perception of risk and thus the value of the package. The type of performance measures, performance targets, and payout zone in combination with the delivered performance eventually results in the actually earned compensation: paid out salary, realised bonus, and actual gains on option or share programmes.

As a result of imperfections in the executive labour market, the compensation committee can make its own judgments within certain constraints; selecting type and number of performance measures, setting challenging or less challenging targets, create more risk or less, create more leverage or less, etc.

Determining the policy structure

When focusing on the direct compensation elements, a typical pay package consists of a basic salary, a short-term incentive and a long-term incentive plan. The difference between the ex ante and ex post value of basic salary is zero, apart from the time value of money. It is not contingent upon performance. Within the short and long-term incentive plan, however, this difference can be significant and depends on the structures of these plans. The typical process steps are described below for the practice of setting the remuneration structure:

1. Company strategy and data collection
2. Selection of performance measures
3. Setting targets and performance incentive zone
4. Determining payment vehicle
5. Implementation

Step 1: Company strategy and data collection

The first phase of designing a new remuneration structure is establishing or re-establishing the objectives of the company. What are short-term and long-term goals? What is the definition of success? Objectives are often explicitly set in line with long-term value creation. To gain insight into the competition, a market overview can be made, which provides information on what types of plans and performance measures are operated by a relevant reference market. This could, for example, be a national or international group of direct competitors. The remuneration committee could decide to adopt the same or similar measures and to follow market practice, or deliberately deviate. In a situation in which competitors, for example, would only operate growth measures, such as revenue, operating earnings, etc., as a competitive edge, the company could decide to particularly focus on ‘value measures’. The aim is to support the strategy of the company through performance-contingent compensation.

Step 2: Selection of performance measures

Based on the type of company and its objectives, performance measures are selected in line with these goals.[134] The trade-off between goal alignment and line of sight is typically explicitly or implicitly taken into account (Baker, 2002). The short-term incentive plan typically operates performance measures that score higher on line of sight, such as accounting-based measures, and goal alignment is critical for the long-term incentive, e.g. through the use of market-based measures, such as Total Shareholder Return and working with equity-based incentives.

Furthermore, a decision needs to be made regarding the desirability of a discretionary element in the remuneration package, which provides the remuneration committee with the possibility to reward for subjectively assessed performance. Basically, the company can decide to incorporate such an element based on two fundamentally different approaches:

1. Operate a separate element, for example, 25% of the total bonus to reward performance that cannot be measured by objective standards. The performance based on objective targets is not affected by the subjective part of the bonus;
2. Operate an element that can change the objective part of the bonus upwards and downwards with, for example, 25% based on subjective performance assessment. This multiplier approach is more in line with the test of fairness as advocated by Eumedion in 2006, as well as with Baker, Gibbons and Murphy (1994), and Jensen, Murphy and Wruck (2004) recommendation 32.

The question of how this element should be incorporated in the policy proves a topic of debate, and is directly or indirectly related to one’s view of the tasks, knowledge level and independence of the remuneration committee.[135] When the compensation committee can be trusted to perform its task well, approach 2 is preferable over approach 1, as it provides greater flexibility in measuring overall performance, helping to reduce noise in good objective

[134] Some industries have specific measures of performance, such as the value of new business (VNB) in the life insurance industry, clinical milestones in the biotechnology industry, etc.

[135] Bebchuk and Fried (2004) argue that there should be no discretionary element, as the compensation committee cannot be trusted to be a good agent for shareholders. It will only use the discretionary element to increase pay of executives regardless of their performance.

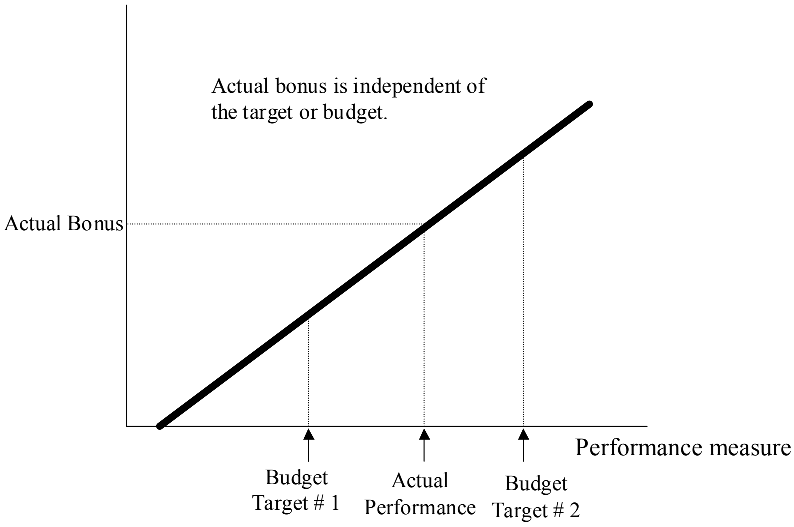
measures and distortion in bad objective measures, and to adapt for unanticipated shocks or inadequately set targets.

Step 3: Setting targets and performance incentive zone

When performance measures have been selected, targets need to be set. Targets can be set using various approaches. Section 2.2 has shown that the budget method is mainly used. This is worrying, as Jensen (2003) has shown that setting targets based on budgets actually "pays people to lie". However, there is no easy solution. Different methods of setting targets, such as using a delta approach, i.e. year-on-year growth, or peer comparison have other drawbacks. Year on year growth is not always possible or even desirable. Peer comparison results in the issue of selecting the right peers, and often there are comparability problems.

Besides setting adequate targets, the performance range should be determined. Figure 2.3 illustrated a typical performance incentive zone for a bonus plan. Nearly all companies cap the bonus payout. The market-performance incentive zone thus deviates from what Jensen, Murphy and Wruck (2004) perceive as a better alternative. They indicate that any kinks and non-linearities result in gaming the system. Therefore, there should be no target setting, and caps should be very high or even non-existent, possibly working with a bonus bank, as illustrated in figure 2.15.

Figure 2.15: Linear performance incentive zone – recommendation 26 of Jensen, Murphy and Wruck (2004)



The linear incentive zone is compelling from a theoretical and incentive viewpoint. However, the lack of explicit caps, which could result in significant bonus payments and, furthermore, the fact that the actual bonus payment is de-coupled from corporate targets, in the Netherlands, would result in public and possibly shareholder scrutiny. Example: suppose a bonus is paid out regardless of the target. If the internal budget target equals 'target # 2' and shareholders also expect this level of performance from the company, the payment as reflected under 'actual bonus' might be scrutinised and perceived as 'pay without performance'. The fully linear system, if introduced, should therefore be designed with great care, adding an effective bonus-bank feature to prevent significant payouts that might be perceived as unjustified.[136]

Another argument why the fully linear performance-incentive zone is not often used in practice is the fact that executive compensation is used as a management steering tool. Creating specific targets in terms of acquisitions, progress made on certain projects, corporate social responsibility milestones, et cetera, can be a reason to make use of explicit targets.

Step 4: Payment vehicle

The final step is to determine the payment vehicle. For short-term incentives, this is typically cash. Within the long-term incentive, the grant vehicle is typically equity-based, i.e. options and/or shares. Decisions are based on various data, such as the current portfolio of the executive, market practice, growth opportunities of the company, etc.

Step 5: Implementation

The implementation phase includes drafting various documents, such as legal plan rules, internal communication documents, external communication documents, such as the remuneration report. In this phase the relevant departments, such as HR, legal, tax, accounting and finance, are further informed to ensure the plan is adequately administrated, the costs are properly allocated and, if desired, the equity plan is hedged. In the Netherlands, the remuneration policy needs to be adopted by the AGM. Shareholders approve the long-term incentive.

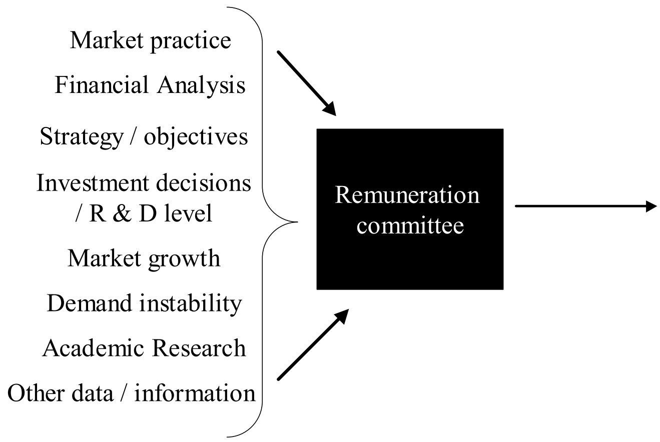
Eclectic perspective – lens 2: policy structure

The second lens summarises the way policy structure is determined. The compensation committee plays an important role in setting ex post compensation levels by designing the structure of compensation. Aligning the interests of management and shareholder (pay-for-performance), is important in this phase. Designing an adequate compensation structure is not a sinecure. Various decisions can undermine the entire programme if they are suboptimal. Creating strong but dysfunctional incentives can eliminate the value/objective of the programme

[136] Even in the case in which targets are set and agreed upon with shareholders, significant bonus payments might be perceived as unjustified in the public eye. A case example is the CEO of Dutch energy company Essent, who received a significant bonus payment in 2005, for the performance year 2004, and was heavily scrutinised for it. He eventually decided to give half of the bonus to charity (Volkskrant 21-4-2005).

(reducing agency costs) and can even (significantly) increase agency costs, hereby destroying value. The remuneration committee needs to interpret market and other data, understand the strategy of the company, its definition of success, understand the historical and current financials of the company, as well as scenarios for the future, understand the working of various compensation instruments, etc. A compensation consultant is often hired to support in this process. Figure 2.16 provides an illustration of the flow of information:

Figure 2.16: Setting policy structure in practice – flow of information



Predicting the eventual outcome is difficult, since decision rules are typically unknown. Different weights might be attached to the different elements; sometimes market practice is more heavily weighted, as compensation committee members do not want to deviate from what is 'accepted in the market', than in other cases, e.g. when the chairman of the committee has a clear and dominant view of what the programme should look like. The element of bounded rationality plays an important role, as the compensation committee does not know or does not go through all possible scenarios; i.e. logic of appropriateness rather than logic of consequence. Programmes can be partially based on criteria such as 'the desire for simplicity' and 'perception' rather than reality. Please also refer to Murphy (2002), who states that share option programmes in the U.S. were partially based on the perceived costs rather than on the real economic costs. A check list of sub optimality is shown in table 2.22.

As mentioned previously, eventual decisions are based on: i) The judgement of the remuneration committee; and ii) The various constraints the committee faces. We will further address these elements in section 2.5.3 and 2.5.4.

Table 2.22: Suboptimal compensation structure – normative check list

Element	Context
Performance measures	1. As there are no perfect performance measures, multiple criteria are combined to ensure line of sight, i.e. being able to influence the outcome, as well as goal alignment, i.e. long-term value creation. Overemphasising line of sight measures can result in destruction of company value. Overemphasising goal alignment measures can result in unmotivated executives and increased retention risk. 2. Although the plan will operate multiple measures to capture the above trade-off, operating too many performance measures can result in a lack of focus regarding what is important and divert effort away from important tasks. 3. Contracts in practice are typically incomplete. When exact definitions of performance measures are not clearly laid down in the contract, including how to deal with exceptional items, goodwill, acquisitions, etc., before the performance period starts, this results in ambiguity at the time of assessing the performance. When EPS is used, for example, will this be undiluted or diluted EPS? When Economic Profit is used, will there be an 'investment relief', and to what extent, or not? Etc. 4. Discretionary elements improve efficiency when the remuneration committee is a good agent for shareholders (and other stakeholders). If this is not the case, they result in decreased efficiency.
Performance targets	5. Targets that are too challenging will result in demotivated executives and a potential retention risk. This can, for example, be checked by comparing the actual payment versus target over a number of years relative to competitors. 6. Targets that are not challenging enough hurt the pay-for-performance principle.
Performance incentive zone	7. Performance incentive zones that are not linear over a vast portion could reward gaming and volatility. Cut-off points, if any, should be carefully chosen.
Payment vehicle	8. If the payment vehicle (cash, options, shares) is not properly selected, this results in excessive risk-taking or insufficient risk-taking. Executives are exposed to both firm specific as well as systematic risk. This indicates that the risk position between the shareholder and the executive is different.[137]

2.5.3 Constraints of the remuneration committee

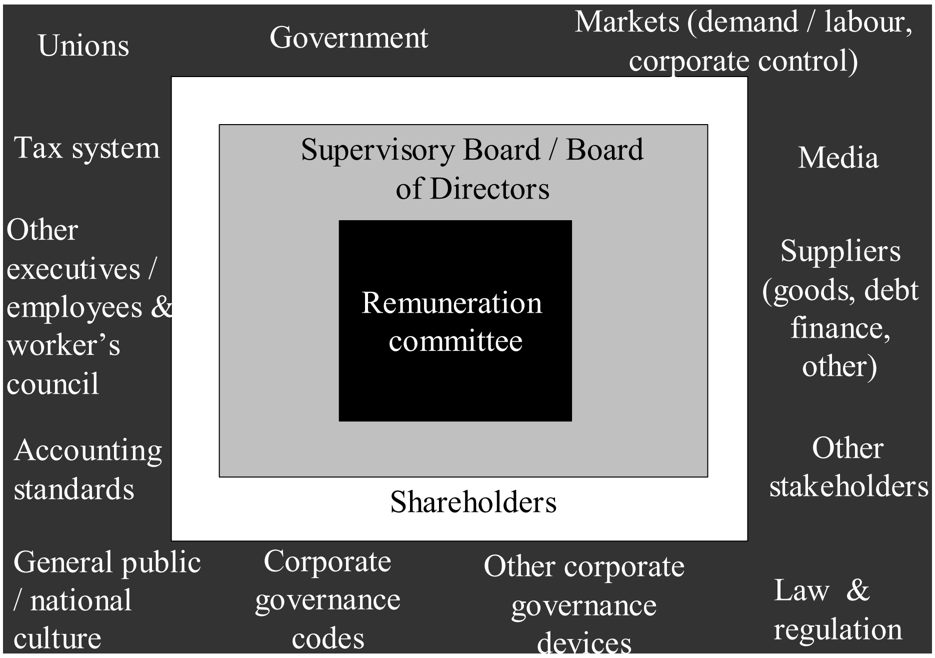
In the previous sections 2.5.1 and 2.5.2, the determination of the level and structure of executive compensation has been discussed on the basis of the real-life context. The first two lenses for the eclectic perspective were provided. The compensation committee plays an important role as it effectively makes decisions regarding ex ante and, indirectly, ex post compensation based on collected information and its own view. The constraints were not yet addressed.

[137] Agency models that incorporate the CEO's aversion to losses are promising in predicting reality. If the executive is more averse to losses, more stock options will be used, as shown by Dittmann, Maug and Spalt (2010).

Eclectic perspective – lens 3: constraints of the remuneration committee

As the executive labour market is highly imperfect, the remuneration committee has significant leeway in which to make its own judgement, assuming there are no other restrictions. However, there are actually various constraints, which have become tighter over the last years as an answer to outcomes and imperfections of the market mechanism. As a result of increased media attention, political interference, corporate governance reforms, increased knowledge regarding the working of the executive labour market and compensation instruments, etc., the range of actions the compensation committee can choose from has decreased. Figure 2.17 illustrates the layers of constraints with which the remuneration committee is faced.

Figure 2.17: Remuneration committee faces various layers of constraints



The first constraint is formed by the other members of the (supervisory) board. This body eventually needs to endorse the proposed policy levels and structure. The second level represents the shareholders. In the Netherlands, the AGM adopts the remuneration policy and approves the long-term incentive plan. The first cases of shareholders voting down the remuneration policy became manifest in 2008, e.g. Philips and Vastned. In some cases, important shareholders are invited to the table to provide their input before the policy is put up for a vote in the AGM. Generally speaking, the ownership structure is important in this respect. Block holders can often more effectively monitor these situations. In the final layer, all other constraints are depicted. Constraints can work both before and after the remuneration policy is determined. As an example, one could look at 'public scrutiny'. The remuneration committee will not be inclined to approve a compensation package on which it anticipates public scrutiny, for fear of reputation damage. Even when this is not taken into account, public scrutiny might act as an ex post constraint due to the remuneration level being adjusted afterwards, resulting from the public often having economic power, e.g. the power to stop buying the company's product.

If compensation committees fail to set adequate policies, their action space will become smaller and smaller as a result of the various parties depicted in figure 2.17 demanding greater influence to the detriment of the action space of the compensation committee.

2.5.4 Categorisation of the remuneration committee

The final lens entails the categorisation of the compensation committee, which further supports an eclectic view on executive compensation theories, because it can reconcile seemingly opposing theories of executive compensation.

Eclectic perspective – lens 4: categorisation of the remuneration committee

Agency theory, through the optimal contracting approach, has not provided conclusive evidence (Prendergast, 1999). Alternative theories have emerged, which has resulted in a total of 16 different executive compensation theories (Otten, 2007). The managerial power framework has received considerable attention from both practitioners and academics. It is a reaction to unsuccessful attempts to explain a number of real life incentive contract aspects with the arm's length bargaining view produced by traditional agency theory (Bebchuk, Fried and Walker, 2002, Bebchuk and Fried, 2003, 2004). Supporting and non-supporting reactions are observed in literature. For example, in an experimental setting, Dorff (2004) shows that managerial power over directors does indeed dramatically impact the pay-setting process, resulting in 'excessive' executive compensation. On the other hand, Murphy (2002) states that the managerial power view is both problematic as a theoretical matter, and too simplistic to explain executive pay practices. Various practices are inconsistent with the managerial power hypothesis.[138]

---

[138] The managerial power hypothesis is largely inconsistent with the most important development in executive compensation practices in the U.S. in the 1990s: the escalation in option-based compensation for both top-level and lower-level executives, as it coincides with increasingly independent corporate boards. This would limit the power of CEOs over their boards and therefore cannot explain the rise in option-based compensation. Furthermore, CEOs hired from outside earn more than CEOs hired from the inside. Based on the managerial power approach, one would expect the opposite, as CEOs would use their relationship to extract rents. Note that Murphy and Zábojník (2007) provide a market-based explanation for the pronounced trend of outside hiring and increased CEO pay levels. Basically, the argument boils down to the change in the composition of managerial skills needed to manage a modern corporation. The assumption is that general components as opposed to firm-specific components of managerial capital are increasingly important. Transferability is also 'priced' in their model, while firm-specific capital is

In summary, and as discussed in section 2.4, the value of the managerial power approach is that it has shown there is an added agency problem; supervisory boards in a two-tier system, and board of directors in a one-tier system might not be perfect agents for the shareholders/owners of the firm (Jensen, Murphy and Wruck, 2004, as well as Bebchuk and Fried, 2004). The degree to which the CEO influences remuneration committee members has implications for the pay package and the nature of solutions to this problem. Collusion is defined as the extra power a CEO has over the remuneration committee apart from his or her 'market' bargaining power, in other words: the power to extract rents from the company.

Secondly, the way decisions are made is essential. Does the remuneration committee base its decisions on all information required for overseeing all possible consequences, i.e. logic of consequence, or does it base its decisions on a limited amount of information and norms, such as market practice or corporate governance best practices, trust, culture, recommendations, rules, history and authority, i.e. logic of appropriateness. The latter also allows for the fact that the knowledge level regarding the company and/or compensation instruments might be low, which can result in taking suboptimal decisions.

Figure 2.18: Categorisation of the remuneration committee

Collusion with CEO

Logic of appropriateness			Logic of consequence
	A: Managerial power / institutional	B: Multiple agency model	
	C: Institutional	D: Optimal contracting	

Independent

The illustration provides a dual continuum along which remuneration committee members, and eventually the committee as a whole, can be categorised. It is assumed that: i) CEOs prefer more rather than less compensation; ii) CEOs will exert the power they have to influence both the level and structure of their pay by influencing remuneration committee members to set remuneration according to his desire.

'unpriced'. In contrast to the managerial power approach, this market-based explanation is consistent with competition and is evidence that the market for CEOs is becoming more important in determining CEO pay levels.

The different theoretical perspectives on the practice of executive compensation are therefore not mutually exclusive. Area D provides an ideal picture, and recommendations for the practice of executive compensation should be based on getting as close as possible to this area, i.e. improve corporate governance and educate compensation committee members, and require a more consequential approach, for example, by requiring scenario modelling of potential ex post remuneration results.[139]

Seemingly opposing recommendations of different scholars can be interpreted on the basis of their starting point. With regard to a possible discretionary element in an annual bonus plan, often based on subjective performance assessment, the following citations provide an example:

1) "As part of the effort to strengthen the link between bonus plans and performance, investors should resist bonus plans that include discretionary elements"
2) "Bonus plans should include a subjective component"

It is probably needless to say that the first citation is from the work of Bebchuk and Fried (2004) and the second from Jensen, Murphy and Wruck (2004). As discretionary elements are often based on subjective performance assessment, these statements seem difficult to reconcile. However, they can both be explained by figure 2.18. The starting point of Bebchuk and Fried (2004) is situated above the horizontal line in figure 2.18. If the CEO has influence over the remuneration committee, a subjective component can be an easy way to extract rents from the company, as there is no measurable performance linkage. As it lacks transparency towards shareholders, i.e. is camouflaged, it is difficult for outsiders to assess whether the bonus is justifiable or not. Therefore Bebchuk and Fried (2004) recommend against discretionary elements in bonus plans. The starting point of Jensen and Murphy (2004) is situated below the horizontal line in table 2.18, area C and especially area D. If a remuneration committee is not influenced by the CEO and acts in the interests of shareholders, subjective performance assessment can be an excellent way to improve the efficiency of a bonus plan. Subjective assessments can, for example, be used to reduce the 'noise' in good objective measures, to reduce the 'distortion' in bad objective performance measures, and can also adjust bonus payments for unanticipated shocks, such as terrorists attacks or shocks to world oil prices.
In fact, it can be concluded that the recommendation of Bebchuk and Fried (2004) with regard to discretionary bonus elements only provides a temporary advice, and only for companies in which compensation committees are situated above the horizontal line in the matrix. If corporate

[139] Scenario modelling is best practice provision II.2.8a of the Dutch Corporate Governance Code (2008).

governance is such that areas C and D are reflective of reality, their recommendation loses its value, and consequently puts question marks at the sustainability of a large part of their theory. Future empirical research, following a contingency approach, should identify what is prevalent under which circumstances.

2.5.5 Summary and conclusion

This section has summarised the practical context in which executive compensation decisions are made. The resulting eclectic perspective contributes to bridging theory and practice. The four lenses can be used by academic scholars to further interpret empirical research and can be an aid to defining new hypotheses. Various market actors can use the lenses to assess the quality of (remuneration committee) decision-making. The compensation committee obtains enhanced insight into their role as the 'spider in the executive compensation web'. Without full understanding of their pivotal role and taking full responsibility for remuneration levels and structure, their action space will become smaller, e.g. as it has become smaller in recent years, as a result of various other parties demanding greater influence, to the detriment of the action space of the compensation committee. Policy makers can understand that it could be highly effective to target compensation committees directly, in view of their pivotal role. Shareholders or other stakeholders can initiate a discussion with the company / compensation committee on the remuneration policy in place, especially when a new remuneration policy is introduced. In such case, the process of adopting the policy would encompass a discussion based on the four lenses of the eclectic perspective.

2.6 Summary and conclusion

2.6.1 Summary

The objective of this chapter is to comment on some of the existing theoretical anchor points from a practical view, focusing on the role of the remuneration committee and its decisions.[140] An eclectic perspective was taken, resulting in four lenses that summarise the practical comments. In section 2.2 to 2.5, four questions were answered: 1) What does the top executive remuneration landscape look like (level and structure)?; 2) What is the role of the remuneration committee in the executive *remuneration level* decision?; 3) What is the role of the remuneration committee in the executive *remuneration structure* decision?; 4) How are real-life executive remuneration decisions made?

Based on the executive remuneration landscape in section 2.2, it was established that there are differences between Europe and the U.S. Within Europe, there are marked differences between countries. Within countries differences are observed between companies. It was concluded that insight into the 'executive remuneration decision' is needed to comprehend more clearly where these differences originate from. Linking theoretical anchor points to the practical context in which these decisions are made can provide such insight.

Section 2.3 has focused on the dynamics of the *remuneration level* decision. Starting from the theoretically limiting case of the perfectly competitive market model, differences in compensation are mainly explained by differences in human capital. Ability in combination with investments in human capital, i.e. education, acquired skills and expertise, which result in relative scarcity, produce higher returns. This fundamentally explains why CEOs earn more than, for example, manufacturing employees, which is due to relative scarcity. Focusing on the CEO labour market demand and supply curves, we established that these are relatively inelastic for the largest listed companies in the economy. When an individual company is searching for a CEO, the labour demand is even perfectly inelastic. This is the result of no close substitution. Furthermore, companies are not easily deterred by high compensation levels, since CEO labour costs are only a fraction of the total costs of the company. There is only a very high natural cap from the demand side; in theory this is the point where the company cannot survive in the long-term, and in practice the point where the market for corporate control acts when CEO pay is far from optimal. The market demand curve, which is largely a horizontal summation of individual demand, is therefore also relatively inelastic. This notion makes the perception and reality of the supply curve even more important in this market. Generally speaking, as a result of inelasticity,

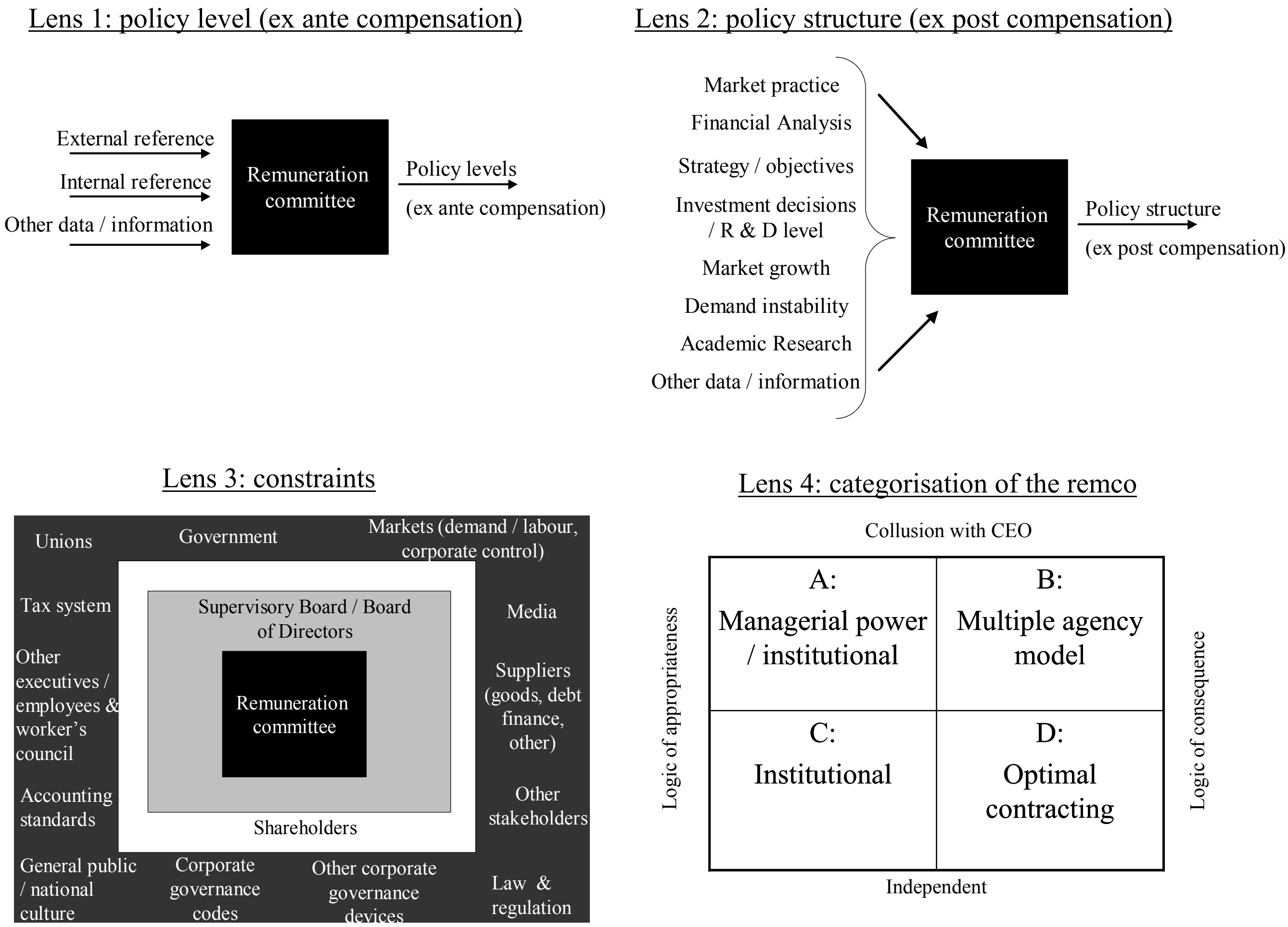
[140] It is here assumed that the remuneration committee effectively represents the full (supervisory) board.

small shifts in either the demand curve or the supply curve can explain significant changes in market prices from this perspective. Further deduction rendered the view that the CEO labour market displays significant deviations from the perfectly competitive model. This conclusion is based on a comparison with the labour market segment for manufacturing employees, and with the share market, one of the financial markets, based on the essential characteristics of perfect factor markets. Operational and informational efficiency is lowest in the CEO labour market as a result of high transaction costs, imperfect information characterised by private information and noise, labour immobility and the impossibility of arbitraging. Due to these imperfections, there is no single market-equilibrium compensation level. The labour demand and supply curves therefore can contribute to explaining general market results and movements; however, these fail to explain individual remuneration packages. The pricing mechanism in this market, apart from the invisible hand, consisting of weak competitive market forces, boils down to pay negotiations between the CEO candidate and the company assumed to be represented by the compensation committee, i.e. the visible hand of the compensation committee. The role of the remuneration (/selection) committee is to attract and retain a qualified CEO at the lowest possible costs to shareholders. Poor bargaining and a misperception of the supply side of the market can prevent such a situation from occurring. Furthermore, increased compensation disclosure has provided CEO candidates with a strong psychological aspiration to maximise, i.e. being paid at least as good as the upper half of the market. This can result in a continuing upward spiral, regardless of shifts in supply and demand curves. Due to the fact that there is no single equilibrium price, stakeholders are unable to assess whether the remuneration committee have performed their job well. Pay differences between CEOs in similar situations can, for example, be the result of inequalities in complexity that are difficult for the outside world to determine. However, they can also be the result of an excellent, or poorly, conducted negotiation. A labour market peer group comparison, in isolation, cannot be used to assess the situation, given the highly individual character of the human capital investment situation, i.e. a combination of a specific firm with a specific individual within a specific context. In case of compensation that is perceived as too high, this could offset costs of outrage that damages the company and its value, especially in an untrusting world that requires increased levels of disclosure and shareholder voting on remuneration policies.

Section 2.4 has focused on the dynamics of the *remuneration structure* decision. Based on an overview of agency theory and the optimal contracting perspectives, it has become clear that the 'principal's problem' involves various trade-offs resulting in different optimal results within different organisations. The remuneration committee strikes a balance between security and risk (/incentives), line of sight versus goal alignment, over-investment versus under-investment, objective versus subjective performance measures, explicit incentives versus relational, reputation and career concerns, etc. Furthermore, since process, context and the underlying model of man are all relevant, additional variation can be explained, given the different design of institutions. An eclectic or contingency approach is needed to understand which elements are most influential in which circumstances.

Section 2.5 has summarised the four lenses of the eclectic perspective, to understand how the remuneration policy is determined in practice. Assessing the quality of the decision is relevant given the fact that decisions are not necessarily based on the logic of consequence.[141] Stakeholders (in particular shareholders) can initiate a discussion based on the four lenses.

Figure 2.19: Overview of the four lenses of the eclectic perspective



Lens 1: policy level – a discussion on the chosen external reference as well as the internal reference. Table 2.21, as presented in this chapter, can be used to analyse potential problems.

[141] Nobel prize winner Daniel Kahneman has furthermore shown that people are not as rational as assumed by the concept of the homo economicus.

Lens 2: policy structure – a discussion on performance measures, e.g. the trade-off between line of sight and goal alignment, performance standards, performance incentive zones and payment vehicles. Figure 2.15 can help with analysing the shape of the performance incentive zone. Table 2.22 can help to assess overall problems with the proposed compensation structure.

Lens 3: constraints – a discussion on the constraints as faced by the compensation committee. Which decisions are solely based on incentive theory and which can be partially or fully attributed to constraints? For example, is the choice for the long-term incentive vehicle solely driven by creating optimal alignment with shareholders, or is it partially or fully tax or accounting driven? Which part is related to corporate governance requirements? Is the level of compensation only based on the collected information, both internal and external reference, or also on perceived and/or real constraints? Et cetera.

Lens 4: categorisation of the compensation committee – the outcome of the executive compensation programme can be used to further analyse the compensation committee. If the outcome of the executive compensation process cannot be explained by lens 1-3, a critical discussion with the compensation committee is needed. Are results based on a lack of knowledge of the company or compensation instruments, or is it likely that the committee favours top management of the company? Lens 4 can provide a starting point for such a discussion. Policy makers and corporate governance platforms can directly target the compensation committee. As a result of its pivotal role, it can improve the working of the executive labour market. The eclectic perspective shows that, despite the imperfections that characterise and will always be a part of the executive labour market, it is important to ensure results are as efficient as possible. Therefore compensation committees should strive for area D.

2.6.2 Conclusion

The design of executive compensation packages is characterised by countervailing forces and ambiguity. On the one hand, this is a direct consequence of the fact that executive compensation in itself is a device to bring parties with partially or totally opposite objectives closer together. On the other, this is caused by the fact that the mechanisms influencing the level and structure of an executive compensation package are sometimes forces in opposite directions, or that certain correlations are positive until a certain point and negative from that point onwards, for example, relating to the trade-off between monitoring and providing incentives, indicating that pay-for-performance is in fact a double-edged sword. Three main conclusions follow from this chapter:

1) The pivotal role of the remuneration committee

The remuneration committee has a pivotal role, in the top executive remuneration decision. This is based on the fact that the market is highly informationally as well as operationally inefficient. The imperfections of this market result in significant deviations from the competitive market model and create a relatively large bid-ask spread. This results in room to manoeuvre for the compensation committee. The knowledge level of the committee and its position towards the CEO, affect remuneration decisions. Stakeholders have become aware of this and have constrained the action space of the remuneration committee, for example by shareholders' vote, corporate governance legal prescriptions and best practices, etc.

2) The case for a contingency approach to empirical research

The top-executive remuneration decision is highly case specific, depending on individual, company, industry and country elements. There is no single theory that really applies. After all, different forces can be stronger in different contexts, creating different results. Furthermore, taking an eclectic perspective has shown that seemingly opposing theories of executive compensation are often far from mutually exclusive. The four lenses, presented in this chapter, can contribute to the informational efficiency of the CEO labour market, by providing information on the executive compensation process and providing ways for shareholders and other stakeholders, to analyse and discuss the process outcome. Academics are provided with insight into the practical process, which contributes to enhanced interpretation of past empirical research and acts as an aid for future empirical research. The conclusion is that a contingency approach, that answers the question; 'Which policies are observed under which circumstances?', can help the research area further. Understanding the shape of executive compensation packages, and being able to effectively measure and compare these structures across firms and across countries, can therefore provide a powerful tool for enhanced understanding of the executive remuneration landscape. The following chapter 3, will focus on the design of such a single quantifiable yardstick to capture the essence of the remuneration policy / contract.

3) The relevance of separating between ex ante and ex post remuneration in empirical research

In practice, the remuneration policy process is split into decisions related to: i) The ex ante level of remuneration on the one hand, and; ii) The structure of remuneration that results in ex post remuneration on the other. Therefore, empirical research that mimics this process will achieve more detailed results. In chapter 4, I will show this for a dataset of profit centre heads.

2.7 References

Acharya, V., John, K., Sundaram, R. (2000), 'On the Optimality of Resetting Executive Stock Options', *Journal of Financial Economics* 57, 65-101.

Aggarwal, R.K., Samwick, A.A. (1999), 'The Other Side of the Trade-off: the Impact of Risk on Executive Compensation', *Journal of Political Economy* 107, 65-105.

Aggarwal, R.K., Samwick, A.A. (2006), 'Empire Builders and Shirkers: Investment Firm Performance and Managerial Incentives', *Journal of Corporate Finance* 12, 489-515.

Aghion, P., Bolton, P. (1992), 'An Incomplete Contracts Approach to Financial Contracting', *The Review of Economic Studies* 59. 473-494.

Akerlof, G. (1970), 'The market for lemons: Quality uncertainty and the market mechanism', *Quarterly Journal of Economics* 89, 488-500.

Altman, E. (1968), 'Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy', *Journal of Finance* 23, 589-609.

Anderson, R.C., Reeb, D.M. (2003), 'Founding Family Ownership and Firm Performance', *Journal of Finance* 58, 1301-1328.

Andres, C., Theissen, E. (2008), 'Setting a Fox to Keep the Geese – Does the Comply or Explain Principle Work?', *Journal of Corporate Finance* 14, 289-301.

Antle, R., Smith, A. (1986), 'An Empirical Investigation of the Relative Performance Evaluation of Corporate Executives', *Journal of Accounting Research* 24, 1-39.

Arrow, K. (1963), 'Uncertainty and the Welfare Economics of Medical Care', *American Economic Review LIII (*5), 941-973.

Bailey, E.E., Helfat, C.E. (2003), 'External Management succession, human capital and firm performance: An Integrative Analysis', *Managerial and Decision Economics* 24, 347-369.

Baker G.P. (2002), 'Distortion and Risk in Optimal Incentive Contracts', *The Journal of Human Resources* 37, 728-751.

Baker, G.P. (1992), 'Incentive Contracts and Performance Measurement', *Journal of Political Economy* 100, 598-614.

Baker, G.P., Gibbons, R., Murphy, K.J. (1994), 'Subjective Performance Measures in Optimal Incentive Contracts', *The Quarterly Journal of Economics* 109, 1125-1156.

Baker, G.P., Hall, B.J. (2004), 'CEO Incentives and Firm Size', *Journal of Labor Economics* 22, 767-798.

Balachandran, S., Carter, M.E., Lynch, L.J. (2004), 'Sink or Swim? Firm's Responses to Underwater Options', *Journal of Management Accounting Research* 16, 1-18.

Banker R.D., Datar, S. (1989), 'Sensitivity, Precision and Linear Aggregation of Signals for Performance Evaluation', *Journal of Accounting Research* 27, 21-39.

Battes, P. (2006), 'Bonusbeleid ABN AMRO krijgt kritiek', *Het Financieele Dagblad* 28-4-2006.

Bebchuk, L., Grinstein, Y. (2005), 'The Growth of Executive Pay', *Harvard Discussion Paper* no. 510.

Bebchuk, L.A., Fried, J.M. (2003), 'Executive Compensation as an Agency Problem', *Journal of Economic Perspectives* 17, 71-92.

Bebchuk, L.A., Fried, J.M. (2004), 'Pay Without Performance, the Unfulfilled Promise of Executive Compensation', *Harvard University Press*, 1-278.

Bebchuk, L.A., Fried, J.M., Walker, D.I. (2002), 'Managerial Power and Rent Extraction in the Design of Executive Compensation', *University of Chicago Law Review* 69, 751-846.

Becker, B. (2006), 'Wealth and Executive Compensation', *The Journal of Finance* Vol LXI, 379-397.

Becker, G. (1962), 'Investment in Human Capital: A theoretical analysis', *Journal of Political Economy* 70, 9-49.

Becker, G. (1964, 1975), 'Human Capital', First and Second Edition, *The University of Chicago Press*

Bergstresser, D, Philippon, T (2006), 'CEO Incentives and Earnings Management', *Journal of Financial Economics* 80, 511-529 (page 528).

Berle, A.A., Means, G.C. (1932), 'The Modern Corporation and Private Property', New York: Macmillan.

Bertrand, M., Mullainathan, S. (2001), 'Are CEOs Rewarded for Luck? The Ones Without Principals Are´, *Quarterly Journal of Economics* V. 116, No 3, 901-932.

Bethel, J.E., Gillan, S.L. (2002), 'The Impact of Institutional and Regulatory Environment on Shareholder Voting', *Financial Management* 31, 29-54.

Bittlingmayer, G, (2000), 'The Market for Corporate Control', In Bouckaert, B. De Gaest, G. (eds.), Encyclopedia of Law and Economics, University of Ghent and Edward Elgar.

Bolton, P., Dewatripont, M. (2005), 'Contract Theory', The MIT Press, 1-724.

Bolton, P., Scharfstein, D.S. (1998), 'Corporate Finance, the Theory of the Firm and Organizations', *Journal of Economic Perspectives* 12, 95-114.

Bolton, P., Scheinkman, J., Xiong, W. (2006), 'Executive Compensation and Short-Termist Behaviour in Speculative Markets', *Review of economic studies* 73, 577-610.

Boschen, J.F., Duru, A., Gordon, L.A., Smith, K.J. (2003), 'Accounting and Stock Price Performance in Dynamic CEO Compensation Arrangements', *The Accounting Review* 78, 143-168.

Bouton Committee (2002), 'Promoting Better Corporate Governance In Listed Companies', AFEP-AGREF MEDEF, 1-28.

Bouwens, J.F.M.G. (2005), 'Prestatiemeting van Binnen en van Buiten', Inaugurele Rede, 1-32.

Brealey, R.A. , Myers, S.C. (2000), 'Principles of Corporate Finance', sixth edition, Irwin McGraw-Hill.

Brenner, M., Sundaram, R.K., Yermack, D. (2000), 'Altering the terms of executive stock options', *Journal of financial economics* 57, 103-128

Brick, I.E., Palmon, O., Wald, J.K. (2006), 'CEO compensation, director compensation, and firm performance: Evidence of cronyism?' *Journal of corporate finance* 12, 403-423

Brickley, J.A., Linck, J.S. , Coles, J.L. (1999), 'What Happens to CEOs After they Retire? New Evidence on Career Concerns, Horizon Problems and CEO Incentives', *Journal of Financial Economics* 52, 341-377.

Brown, M. , Falk, A., Fehr, E. (2004), 'Relational Contracts and the Nature of Market Interactions', *Econometrica* 72, 747-780.

Bryan, S. , Nash, R., Patel, A. (2006), 'Can the Agency Costs of Debt and Equity Explain the Changes in Executive Compensation during the 1990s?', *Journal of Corporate Finance* 12, 516-535.

Bushman, R.M., Smith, A.J. (2001), 'Financial Accounting Information and Corporate Governance', *Journal of Accounting and Economics* 32, 237-333.

Cadbury Committee (1992), 'The Financial Aspects of Corporate Governance', 1-90

Carter, E., Lynch, L. (2001), 'An Examination of Executive Stock Option Repricing', *Journal of Financial Economics* 61, 207-225.

Castanias, R.P., Helfat, C.E. (1991), 'Managerial Resources and Rents', *Journal of Management* 17, 155-171.

Castanias, R.P., Helfat, C.E. (2001), 'The Managerial Rents Model: Theory and Empirical Analysis', *Journal of Management 2*7, 661-678.

Chance, D., Kumar, R. , Todd, R. (2000), 'The Repricing of Executive Stock Options', *Journal of Financial Economics* 57, 129-154.

Chidambaran, N., Prabhala, N. (2003), 'Executive Stock Option Repricing, Internal Governance Mechanisms and Management Turnover', *Journal of Financial Economics* 69, 153-189.

Chung, K.H., Jo, H. (1996), 'The Impact of Security Analyst's Monitoring and Marketing Functions on the Market Value of Firms', *Journal of Financial and Quantitative Analysis* 31, 493-512.

Coase, R. H. (1937), 'The Nature of the Firm', *Economica* 4, 386-405.

Coase, R.H. (1960), 'The Problem of Social Cost', *Journal of Law and Economics* 3, 1-44.

Coles, J.L., Hertzel, M., Kalpathy, S. (2006), 'Earnings Management Around Employee Stock Option Reissues', *Journal of Accounting and Economics* 41, 173-200.

Combined Code on Corporate Governance (2000, 2003, 2006), United Kingdom, 1-14.

Commission Recommendations (2004), *Official Journal of the European Union* 14 December 2004.

Commission Staff Working Document (2007), 'Report on the application by Member States of the EU and the Commission Recommendation on director's remuneration'

Conyon, M.J., Murphy, K.J. (2000), 'The Prince and the Pauper? CEO pay in the United States and the United Kingdom', *The Economic Journal* 110, 640-671.

Cools, C., Van Praag, M. (2007), 'The Value Relevance of Top Executive Departures: Evidence from the Netherlands', *IZA Discussion Paper Series* No 3054, 1-26.

Copeland, T., Koller, T., Murrin, J. (1996), 'Valuation; Measuring and Managing the Value of Companies', John Wiley & Sons, Inc.

Core, J.E., Guay, W.R., Thomas, R.S. (2004), 'Is U.S. CEO Compensation Inefficient Pay Without Performance?', *Working Paper*

Core, J.E., Guay, W.R., Verrecchia, R.E. (2003), 'Price versus Non-Price Performance Measures in Optimal CEO Compensation Contracts', *The Accounting Review* 78, 957-981.

Crawford, V., Sobel, J. (1982), 'Strategic Information Transmission', *Econometrica* 50, 1431-1451.

Cromme Committee (2002, 2003, 2005, 2006, 2007), 'The German Corporate Governance Code', 1-16.

Cullinan, C.P., Du, H., Wright, G.B. (2006), 'A Test of the Loan Prohibition of the Sarbanes-Oxley Act: Are Firms that grant loans to executives more likely to misstate their financial results?', *Journal of Accounting and Public Policy* 25, 485-497.

Cyert, R.M., March, J.G. (1963), 'A Behavioral Theory of the Firm' (2ed, 1999), Oxford Blackwell Publishers.

Davis, J.H., Schoorman, F.D., Donaldson, L. (1997a), 'Toward a Stewardship Theory of Management', *The Academy of Management Review* 22, 20-47.

Davis, J.H., Schoorman, F.D., Donaldson, L. (1997b), 'Davis, Schoorman and Donaldson Reply: The Distinctiveness of Agency Theory and Stewardship Theory', *The Academy of Management Review* 22, 611-613.

Denis, D.J., Hanouna, P., Sarin, A. (2006), 'Is there a Dark Side to Executive Compensation?', *Journal of Corporate Finance* 12, 467-488.

Dewatripont, M., Jewitt, I., Tirole, J. (1999) 'The Economics of Career Concerns: Part I , II', *Review of Economic Studies* 66, 183-217.

Dittmann, I., Maug, E., Spalt, O. (2010), 'Stick or Carrots? Optimal CEO Compensation when Managers are Loss Averse', *Journal of Finance* 65, 2015-2050.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Schleifer, A. (2008), 'The Law and Economics of Self-dealing', *Journal of Financial Economics* 88, 430-465.

Djankov, S., Nenova, T., McLiesh, C., Schleifer, A. (2003), 'Who owns the Media?', *Journal of Law and Economics* 46, 341-381.

Dorff, M. (2004), 'Does one Hand Wash the Other? Testing the Managerial Power and Optimal Contracting Hypotheses of Executive Compensation', *Law Review* 1, 1-71.

Duffhues, P.J.W. (2000), 'Ondernemingsfinanciering: oriëntatie op integratie', Kluwer, Deventer, 1-147.

Duffhues, P.J.W. (2006), 'Ondernemingsfinanciering, Corporate Governance en Tobin's Q', *Afscheidsrede*, Universiteitsdrukkerij Universiteit van Tilburg, 1-43.

Duffhues, P.J.W., Jobsen, M. (2006), 'Imperfecties op de Arbeidsmarkt voor Topbestuurders', (in Dutch), *ESB* 91, 3 November 552-555.

Duffhues, P.J.W., Jobsen, M. (2007), 'Structuur Arbeidsmarkt voor Topbestuurders' (in Dutch), *ESB* 91, 9 February 2007, 90-92.

Duvallet, J., Garapin, A, Hollard, M., Llerena, D. (2004), 'A Simulation Model of the Price Bargaining Rules in Vertical Relationships', *Computational Economics* 23, 121-145.

Dyck, A. , Zingales, L. (2002), 'The Corporate Governance Role of the Media. The Right to Tell: The Role of Mass Media in Economic Development', Oxford University Press, New York, 107-147.

Eaton, J., Rosen, H. (1983), 'Agency Delayed Compensation and the Structure of Executive Remuneration', *Journal of Finance* 38, 1489-1505.

Ees, H. van, Engesaeth, E., Laan, G., Selker, C. (2007), 'De Relatie Tussen de Bezoldiging van Bestuurders van Beursgenoteerde Ondernemingen en de Prestaties van deze Ondernemingen', 1-160 (www.corpgov.nl).

Efendi, J., Srivastava, A., Swanson, E.P. (2004), 'Why Do Corporate Managers Misstate Financial Statements? The Role of Option Compensation, Corporate Governance and Other Factors', Texas University *Working Paper*, SSRN Library 547922.

Ehrenberg, R.G., Smith, R.S. (1997), 'Modern labor economics', *Addison Wesley series in economics*.

Engesaeth, E.J.P. (2006), 'Focus op Herijken Beloningsbeleid Bestuur', *Het Financieele Dagblad* 8 March 2006.

Eumedion (2006), 'Recommendations on Executive Remuneration' (December 2006), Fama, E. (1980), 'Agency Problems and the Theory of the Firm', *Journal of Political Economy* 88, 288-307.

Fama, E.F. (1965), 'The Behavior of Stock Market Prices', *Journal of Business* 38, 34-105.

Fama, E.F. (1970), 'Efficient Capital Markets: A Review of Theory and Empirical Work', *The Journal of Finance* 25, 383-417.

Feltham, G.A., Xie, J. (1994), 'Performance Measures Congruity and Diversity in Multi-Task Principal/Agent Relations', *The Accounting Review* 69, 429-453.

Ferrarini, G., Ungureanu, M.C. (2010), 'Economics, Politics, and the International Principles for Sound Compensation Practices, An Analysis of Executive Pay at European Banks', *Working Paper* SSRN 1707344.

Frijns, J. (2005, 2006, 2007), 'Monitoring Report Dutch Corporate Governance Code' (www.corpgov.nl)

Frijns, J. (2008), 'Dutch Corporate Governance Code' - amended (www.corpgov.nl)

Gabaix, X., Landier, A. (2008), 'Why Has CEO Pay Increased So Much?', *Quarterly Journal of Economics* 123, 49-100.

Gale, D., Hellwig, M. (1985), 'Incentive-Compatible Debt Contracts: The One-Period Problem', *Review of Economic Studies* LII, 647-663.

Garen, J.E. (1994), 'Executive Compensation and Principal-Agent Theory', *The Journal of Political Economy* 102, 1175-1199.

Gibbons, R. (1998), 'Incentives in Organisations', *The Journal of Economic Perspectives* 12, 115-132.

Gibbons, R. (2005), 'Incentives between Firms (and Within)', *Management Science* 51, 2-17.

Gibbons, R., Murphy, K. (1990), 'Relative Performance Evaluation for Chief Executive Officers', *Industrial and Labor Relations Review* 43, 30-51.

Gibbons, R., Murphy, K. (1992), 'Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence', *The Journal of Political Economy* 100, 468-505.

Gillan, S.L. (2006), 'Recent Developments in Corporate Governance: An Overview', *Journal of Corporate Finance* 12, 381-402.

Goldman, E., Slezak, S.L. (2006), 'An Equilibrium Model of Incentive Contracts in the presence of Information Manipulation', *Journal of Financial Economics* 80, 603-626.

Gomez-Meija, L., Wiseman, R.M. (1997), 'Reframing Executive Compensation: An Assessment and Outlook', *Journal of Management* 23, 291-374.

Graham, C. (2005), 'The Economics of Happiness', *World Economics* 6, 41-55.

Graham, J.R., Harvey, C.R., Rajgopal, S. (2005), 'The Economic Implications of Corporate Financial Reporting', *Journal of Accounting and Economics* 40, 3-73.

Greenbury Committee (1995), 'Study Group of Director's Remuneration', 1-54.

Grossman, S. J., Hart, O.D. (1982), 'Corporate Financial Structure and Managerial Incentives', In: The Economics of Information and Uncertainty. Ed. by J. J. McCall. Chicago: The University of Chicago Press, 123-155.

Grossman, S., Stiglitz J.E. (1980), 'On The Impossibility of Informationally Efficient Markets', *The American Economic Review* 70, 393-408.

Grossman, S.J., Hart, O.D. (1983), 'An Analysis of the Principal Agent Problem', *Econometrica* 51, 7-45.

Grossman, S.J., Hart, O.D. (1986), ‘The Costs and Benefits of Ownership: A theory of Vertical and Lateral Ownership’, *Journal of Political Economy* 94, 691-719.

Haanen, R., Maas, V., Van Triest, S. (2006), ‘Relatieve prestatiemeting bij AEX-fondsen’, *MAB*, 80, 494-502.

Hall, B., Murphy, K. (2002), ‘Stock Options for Undiversified Executives’, *Journal of Accounting , Economics* 33, 3-42.

Hall, B.J., Liebman, J.B. (1998), ‘Are CEOs really Paid Like Bureaucrats?’, *The Quarterly Journal of Economics* 113, 653-691.

Hallock, K.F., Oyer, P. (1999), ‘The Timeliness of Performance Information in Determining Executive Compensation’, *Journal of Corporate Finance* 5, 303-321.

Hampel Committee (1998), ‘Committee of Corporate Governance’, 1-65.

Harris, D., Helfat, C. (1997), ‘Specificity of CEO Human Capital and Compensation’, *Strategic Management Journal* 18, 895-920.

Hart, O. (1995), ‘Firms, Contracts and Financial Structure’, Oxford: Clarendon Press

Hart, O. (2001), ‘Financial Contracting’, *Journal of Economic Literature* 39, 1079-1100.

Hart, O., Holmstrom, B. (1987), ′The Theory of Contracts’, in Advances in Economic Theory – Fifth World Congress, *Cambridge University Press*, 71-157.

Hart, O., Moore, J. (1990), ‘Property Rights and the Nature of the Firm’, *Journal of Political Economy* 98, 1119-1158.

Hartzell, M., Starks, L. (2003), ‘Institutional Investors and Executive Compensation’, *Journal of Finance* 58, 2351-2374.

Haubrich, J.G. (1994), ‘Risk Aversion, Performance Pay and the Principal-Agent Problem’, *Journal of Political Economy* 102, 258-276.

Heidrick & Struggles (2007, 2009), ‘Corporate Governance in Europe’.

Hicks, J.R. (1966), ‘The Theory of Wages’ 2d ed., New York St. Martin’s Press 241-247.

Himmelberg, C.P., Hubbard, R.G. (2000), ‘Incentive Pay and the Market for CEOs: An Analysis of Pay-For-Performance Sensitivity’, *Working paper* SSRN 236089.

Hirshleifer, D., Suh, Y. (1992), ‘Risk, Managerial Effort and Project Choice’, *Journal of Financial Intermediation* 2, 308-345.

Holmstrom, B. (1979), ‘Moral Hazard and Observability’, *Bell Journal of Economics* 10, 74-91.

Holmstrom, B. (1981), ′Contractual Models of the Labor Market’, *The American Economic Review* 71, 308-313.

Holmstrom, B, (1982a), ‘Moral Hazard in Teams’, *Bell Journal of Economics* 13, 324-240.

Holmstrom, B, (1982b), ‘Managerial Incentive Problems: A Dynamic Perspective’, originally printed in *Essays in Economics and Management in Honor of Lars Wahlbeck* (Helsinki: Swedish School of Economics) and reprinted in *The Review of Economic Studies* 66, 169-182 (1999).

Holmstrom, B. (1999), ′The Firm as a Subeconomy′, *Journal of Law, Economics and Organization* 15, 74-102.

Holmstrom B., Milgrom, P. (1987), ‘Aggregation and Linearity in the Provision of Intertemporal Incentives’, *Econometrica* 55, 303-328.

Holmstrom, B., Milgrom, P. (1991), 'Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership and Job Design', *Journal of Law, Economics and Organization* 7, 24-52.

Holmstrom, B., Milgrom, P. (1994), 'The Firm as an Incentive System', *American Economic Review* 84, 972-991.

Holmstrom B., Roberts, J. (1998), 'The Boundaries of the Firm Revisited', *The Journal of Economic Perspectives* 12, 73-94.

Holmstrom, B., Tirole, J. (1991), 'Transfer Pricing and Organizational Form', *Journal of Law, Economics and Organization* 7, 201-228.

Holmstrom, B., Tirole, J. (1993), ´Market Liquidity and Performance Monitoring', *The Journal of Political Economy* 101, 678-709.

Holthausen, R.W., Larcker, D.F., Sloan, R.G. (1995), ´Annual bonus schemes and the manipulation of earnings´, *Journal of Accounting and Economics*, 19, 29-74.

Houthakker, H.S., Williamson, P.J. (1996), ´The Economics of Financial Markets´, Oxford University Press.

Hwang, L., Lilien, S. (2000), ´CEO Stock-based Compensation: an Empirical Analysis of Incentive Intensity Relative Mix and Economic Determinants´, *The Journal of Business* 73, 661-693.

Internet – www.abnamro.com (Agenda AGM 27 April 2006)

Internet – www.bestuursvoorzitter.nl

Internet – www.corporategovernancecommittee.be

Internet – www.justitie.nl

Internet – www.minfin.nl

Internet – www.nyse.com

Internet – www.sarbanes-oxley.com

Internet – www.wsj.com

Jacobsen J.P., Skillman, G.L. (2004), ´Labor markets and employment relationships; a comprehensive approach', Blackwell Publishing

Janakiram, S., Lambert, R., Larcker, D. (1992), ´An Empirical Investigation of the Relative Performance Evaluation Hypothesis´, *Journal of Accounting Research* 30, 53-69.

Jensen, M.C. (1986), ´Agency costs of Free Cash Flow, Corporate Finance and Takeovers´, *American Economic Review* 76, 323-329.

Jensen, M.C. (1993), ´The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems´, *Journal of Finance* 48, 831-880.

Jensen, M.C. (2001), ´Value Maximisation Stakeholder Theory, and the Corporate Objective Function´, *European Financial Management* 7, 297-317.

Jensen, M.C. (2003) ´Paying People to Lie: The Truth about the Budgeting Process´, *European Financial Management* 9, 379-406.

Jensen, M.C. (2004), ´The Agency Costs of Overvalued Equity and the Current State of Corporate Finance´, *European Financial* Management 10, 549-565 + Lecture at Amsterdam Centre for Corporate Finance, September 2004.

Jensen, M.C. (2005), ´Agency Costs of Overvalued Equity´, *Financial Management* Spring 2005, 1-21.

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

Jensen, M.C., Meckling, W.H. (1994), ´The Nature of Man´, *Journal of Applied Corporate Finance* 7, 4-19.

Jensen, M.C., Murphy, W.H , Wruck, K.H. (2004), ´Remuneration: where have we been, how we got here, what are the problems, and how to fix them´, *ECGI Working Paper Series in Finance* 44/2004

Jensen, M.C., Murphy, W.H. (1990), ´Performance Pay and Top Management Incentives´, *Journal of Political Economy* 98, 225-264.

Johnson, S., La Porta, R., Lopez-de-Silanes, F., Schleifer, A. (2000), ´Tunneling´, *American Economic Review Papers and Proceedings* 90, 22-27.

Jong, A. de, Nguyen, T., Kabir, R. (2008), ´Capital Structure Around the World: The Roles of Firm- and Country-Specific Determinants´, *Journal of Banking and Finance* 32, 1954-1969.

Kahneman, D., Knetsch, J., Thaler, R. (1990), ´Experimental Tests of the Endowment Effect and the Coase Theorem´, *Journal of Political Economy* 98, 1325-1348.

Kahneman, D., Knetsch, J., Thaler, R. (1991), ´The Endowment Effect, Loss Aversion and Status Quo Bias: Anomalies´, *Journal of Economic Perspectives* 5, 193-206.

Kahneman, D., Tversky, A. (1973), ´On the Psychology of Prediction´, *Psychological Review* 80, 237-251.

Kahneman, D., Tversky, A. (1979), ´Prospect Theory: An Analysis of Decisions under Risk´, *Econometrica* 47, 263-291.

Kaplan, S.N. (1997), ´Corporate Governance and Corporate Performance: A comparison of Germany, Japan, and the U.S.´, *Journal of Applied Corporate Finance* 9, 86-93.

Kaplan, S.N., Stromberg, P. (2003), ´Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts´, *Review of Economic Studies* 70, 281-315.

Khurana (2002a), ´Market Triads: A Theoretical and Empirical Analysis of Market Intermediation´, *Journal for the Theory of Social Behaviour* 32, 240-262.

Khurana (2002b), ´Searching for a Corporate Savior: The Irrational Quest for Charismatic CEOs´, Princeton University Press.

Klein, B., Crawford, R.G., Alchian, A. (1987), ´Vertical integration, Appropriable rents and the Competitive Contracting Process´, *Journal of Law and Economics* 21, 257-285.

La Porta, R., Lopez de Silanes, F., Schleifer, A. (1999), ´Corporate Ownership Around the World´, *Journal of Finance* 54, 471-517.

Lambert, R.A. (2001), 'Contracting Theory and Accounting', *Journal of Accounting , Economics* 32, 3-87.

Lambert, R.A. , Larcker, D.F. (1987), ´An Analysis of the Use of Accounting and Market Measures of Performance in Executive Compensation Contracts´, *Journal of Accounting Research* 25, 85-125.

Layard, R. (2005), 'Happiness: Lessons from a New Science', New York Penguin Press

Lazear, E.P. (1989), ´Pay Equality and Industrial Politics´, *The Journal of Political Economy* 97, 561-580.

Lazear, E.P., Rosen, S. (1981), 'Rank-Order Tournaments as Optimum Labor Contracts', *Journal of Political Economy* 88, 841-864.

Leupen, J. (2006) ´Koppen Rollen in Optieschandaal VS´, *Het Financieele Dagblad*, 1 June 2006.

Lewellen, W., Loderer, C., Martin, C. (1987), ´Executive Compensation and Executive Incentive Problems: an Emprical Evidence´, *Journal of Accounting and Economics* 9, 287-310.

Lo, A.W. (1997), 'Market Efficiency: Stock Market Behaviour in Theory and Practice Volumes I , II', The International Library of Critical Writings in Economics, Edward Elgar Publishing Limited.

Malmendier, U., Tate, G.A. (2009) 'Superstar CEOs', *Quarterly Journal of Economics* 124, 1593-1638.

Marshall, A. (1923), 'Principles of Economics', 8th ed London Macmillan, 518-538.

Maskin, E., Tirole, J. (1999), ´Unforeseen Contingencies and Incomplete Contracts´, *The Review of Economic Studies* 66, 83-114.

Maslow, A.H. (1943), ´A Theory of Human Motivation´, *Psychological Review* 50, p. 370.

McCahery, J., Khachaturyan, A. (2006), ´Transatlantic Corporate Governance Reform, in Advances in Corporate Finance and Asset Pricing in honour of Professor Dr. Piet Duffhues´, Elsevier, Chapter 7, 189-197.

McConvill, J. (2005), ´Positive Corporate Governance and its Implications for Executive Compensation', *German Law Journal* 6, 1777-1804.

Meulbroek, L. (2001), ´The Efficiency of Equity-linked Compensation: Understanding the Full Cost of Awarding Executive Stock Options´, *Financial Management*, 5-44.

Milbourn, T.T. (2001), ´Management Compensation in the Netherlands: Theory Evidence, and Best Practice´, *ACCF Topics in Corporate Finance* 4, ISBN 90-805728-4-5.

Mincer (1970), ´The Distribution of Labor Incomes: A Survey with Special Reference to the Human Capital Approach´, *Journal of Economic Literature* 8, 1-26.

Mirrlees, J.A. (1971), ´An Exploration in the Theory of Optimal Income Taxation´, *Review of Economic Studies* XXXVIII, 175-208.

Modigliani, F., Miller, M.H. (1958), ´The Cost of Capital, Corporation Finance and the Theory of Investment´, *American Economic Review* 48, 261-297.

Modigliani, F., Miller, M.H. (1963), ´Corporate Income Taxes and the Cost of Capital: A Correction', *American Economic Review*, 53(3), 433–43.

Morgan, A.G., Poulsen, A.B. (2001), ´Linking Pay to Performance – Compensation Proposals in the S,P 500´, *Journal of Financial Economics* 62, 489-523.

Morgan, A.G., Poulsen, A.B. , ´Wolf, J. (2006), The Evolution of Shareholder Voting for Executive Compensation Schemes´, *Journal of Corporate Finance* 12, 715-737.

Murphy, K. (1999), ´Executive Compensation' in *Handbook of Labor Economics*, edited by Olrey Aschenfelter and David Card Vol 3, bk 2. New York.

Murphy, K. (2002), ´Explaining Executive Compensation: Managerial Power versus Perceived Cost of Stock Options', *The University of Chicago Law Review* 69, 847-869.

Murphy, K., Zábojník, J. (2007), ´Managerial Capital and the Market for CEOs´, *Working paper* SSRN 984376.

Nohel, T., Todd, S. (2005), ´Compensation for Managers with Career Concerns: the Role of Stock Options in Optimal Contracts´, *Journal of Corporate Finance* 11, 229-251.

North, D. (1990) ´Institutions, Institutional Change and Economic Performance', Cambridge University Press.

Oczkowski, E. (1999), ´An Econometric Analysis of the bilateral monopoly', *Economic Modelling* 16, 53-69.

Otten, J. (2007), ´Origins of executive pay and corporate governance reform codes. Essays on an institutional approach to corporate governance', Dissertation, Utrecht School of Economics.

Pauly, M.V. (1968), ´The Economics of Moral Hazard: Comment', *American Economic Review* 58, 531-537.

Peter's committee report (1997), 'Corporate governance in the Netherlands, forty recommendations', 1-42.

Praag, C.M. Van (2005), ´Literatuuronderzoek Relatie Beloning van Topbestuurders en Bedrijfsprestaties, In Opdracht van de Monitoring Commissie Corporate Governance Code', 1-78.

Prendergast, C. (1999), 'The Provision of Incentives in Firms', *Journal of Economic Literature* 37, 7-63.

Rappaport, A. (1999), ´New Thinking on How to Link Executive Pay with Performance´, *Harvard Business Review* 2, 91-101.

Renneboog, L. (2005), ´Does Corporate Governance Matter?', *Background Paper to the Inaugural Lecture 9/12/2005*, Tilburg University.

Rosen S. (1981), 'The Economics of Superstars', *American Economic Review* 71, 845-858.

Rosen, S. (1986), ´Prizes and incentives in Elimination Tournaments´, *American Economic Review* 76, 701-715.

Rosen, S. (1992), ´Contracts and the Market for Executives', in *Contract Economics* Lars Werin and Hans Wijkander, eds Cambridge: MA Blackwell, 181-211.

Ross, S.A. (1973), ´The Economic Theory of Agency: The Principal's Problem´, *American Economic Review*, Paper and Proceedings 63, 134-139.

Ryan, H. , Wiggens, R. (2001), ´The Influence of Firm-specific Characteristics on the Structure of Executive Compensation´, *Journal of Corporate Finance* 7, 101-123.

Salanié, B. (1997), ´The Economics of Contracts. A Primer´, *The MIT Press*, 1-223.

Samuelson, P.A. (1965), ´Proof that Properly Anticipated Prices Fluctuate Randomly´, *Industrial Management Review* 6, 41-49.

Schultz, T.W. (1960), ´Capital Formation by Education´, *Journal of Political Economy* 68, 571-583.

Shleifer, A., Vishny, R.W. (1986), ´Large Shareholder and Corporate Control´, *Journal of Political Economy*, 94, 461-488.

Shleifer, A., Vishny, R.W. (1989), ´Management Entrenchment: the Case of Manager-Specific Investments´, *Journal of Financial Economics* 25, 123-140.

Shleifer, A., Vishny, R.W. (1997), ´A Survey of Corporate Governance´, *The Journal of Finance*, 52, 737-775.

Sloan, R.G. (1993), ´Accounting Earnings and Top Executive Compensation´, *Journal of Accounting and Economics* 16, 55-100.

Smith, A. (1776), ´An inquiry into the Nature and Causes of the Wealth of Nations´, New York Modern Library (1937).

Spence, M. (1973), ´Job market signalling´, *Quarterly Journal of Economics* 87, 355-374.

Spence, M., Zeckhauser, M. (1971), ´Insurance Information and Individual Action´, *American Economic Review*, Paper and Proceedings LXI (2), 380-387.

Stichting Corporate Governance Onderzoek voor Pensioenfondsen (SCGOP), 'Recommendations on Executive Remuneration' (March 2003).

Stiglitz, J.E. (1977), ´Monopoly, Non-Linear Pricing and Imperfect Information: The insurance Market', *Review of Economic Studies* XLIV, 407-430.

Stovall, O.S., Neill, J.D., Perkins, D. (2004), 'Corporate Governance, Internal Decision Making, and the Invisible Hand', *Journal of Business Ethics* 51, 221-227.

Stulz, R.M. (1990), 'Managerial Discretion and Optimal Fiancing Policies', *Journal of Financial Economics* 26, 3-27.

Tabaksblat Committee (2003), 'The Dutch Corporate Governance Code', Website Corporate Governance Committee (www.corpgov.nl), issued December 9.

Tian, Y.S. (2004), 'Too Much of a Good Incentive? The Case of Executive Stock Options', *Journal of Banking , Finance* 28, 1225-1245.

Tirole, J. (1999), 'Incomplete Contracts, Where do we Stand?', *Econometrica* 67, 741-781.

Tosi, H.L., Greckhamer, T. (2004), 'Culture and CEO Compensation', *Organization Science* 15, 657-670.

Towers Perrin (2004), 'European Annual Incentive Plan Design Survey'.

Towers Perrin (2005), 'Equity Incentives Around the World'.

Towers Perrin (2005/2006), 'Worldwide Total Remuneration Survey (WWTR); Managing Global Pay and Benefits'.

Tversky, A., Kahneman, D. (1974), 'Judgment under Uncertainty: Heuristics and Biases', *Science* 185, 1124-1131.

Tversky, A., Kahneman, D. (1981), 'The Framing of Decisions and the Psychology of Choice', *Science* 211, 453-458.

Tversky, A., Kahneman, D. (1986), 'Rational Choice and the Framing of Decisions', *Journal of Business* 59, 251-278.

Tversky, A., Kahneman, D. (1991), 'Loss Aversion in Riskless Choice: A Reference-Dependent Model', *Quarterly Journal of Economics* 106, 1039-1061.

Tversky, A., Kahneman, D. (1992), 'Advances in Prospect Theory: Cumulative Representation of Uncertainty', *Journal of Risk and Uncertainty* 5, 297-323.

Vienot I Committee (1995) – Conseil National du Patronat Francais (CNPF), Association Francaise des Entreprises Privees (AFEP), 1-24

Vienot II Committee (1999), Mouvement des Entreprises de France (MEDEF) (formerly CNPF), Association Francaise des Enterprises Privees (AFEP), 1-11.

Walker, K.B., Johnson, E.N. (1999), 'The Effect of Budget-Based Incentive Compensation Scheme on the Budgeting Behavior of Managers and Subordinates', *Journal of Management Accounting Research* 11, 1-28.

Watson, D.S., Holman, M.A. (1977), 'Price Theory and its Uses', Houghton Mifflin Company Boston, 1-445.

Weston, J.F., Siu, J.A., Johnson B.A. (2004) 'Takeovers, Restructuring, and Corporate Governance', Prentice Hall.

Williamson, O.E. (1971), 'The Vertical Integration of Production: Market Failure Considerations', *American Economic Review* 61, 112-1123.

Williamson, O.E. (1979), 'Transaction Cost Economics: The Governance of Contractual Relations', *Journal of Law and Economics* 22, 233-261.

Williamson, O.E. (1985), 'The Economic Institutions of Capitalism', New York: Free Press.

Yermack, D. (1995), 'Do Corporations award CEO Stock Options Effectively?', *Journal of Financial Economics* 39, 237-269.

Yermack, D. (2006), 'Flight of Fancy: Corporate Jets, CEO Perquisites and Inferior Shareholder Returns', *Journal of Financial Economics* 80, 211-242.

Zeckhauser, R. (1970), 'Medical Insurance: A case study of the Tradeoff between Risk Spreading and Appropriate Incentives', *Journal of Economic Theory* 2, 10-26.

Zingales, L. (2000), 'In Search of New Foundations', *The Journal of Finance* 55, 1623-1653.

Appendix 2.1: The questionnaire

-July 2007-

Pay for performance in Europe and United States – Research Monitoring Committee Corporate Governance the Netherlands

A) General questions

Question 1: Context in which remuneration decisions are made:

Most prevalent board model: one tier or two tier?

How many of the companies in the research group have a separate committee which deals with the remuneration of the management board/top executives (such as a remuneration committee)? Please fill in the table below:

Prevalence of separate Committee	Percentage of total sample
There is a separate Remuneration (and nomination(appointments?)) committee	%
There is no separate committee which deals with remuneration related issues for the executive board/top executives	%
Total	**100%**

Question 2: Tax constraints

Which types of tax constraints are applicable? Examples: in the United States basic salary is 'capped' at a million dollars, in the Netherlands equity-based long-term incentives are no longer deductible from corporation tax. Please fill in the table below:

	Applicable?		Applies to?		Brief explanation/background
	Yes	No	Corporation	Individual	
Specific tax constraints related to basic salary?					
Specific tax constraint related to bonus plans?					
Specific tax constraint					

related long-term incentive plans?					
Tax favoured share option plan?					
Tax favoured share plan?					

How important are tax considerations in the design of the remuneration package based on your consulting estimate (scale from 1 to 5 on the direct compensation elements). Please fill in the table below:

	1-Significantly important	2	3 - Important	4	5-Not important
Basic salary					
Short-term incentive					
Long-term incentive					

Question 3: defining (expected/ex ante) pay levels

How are total direct compensation levels (and mix) typically set (expected compensation)?

	Tick box which is most applicable or provide relevant description
External reference (labour market peer group)	
Internal reference (internal equity considerations or tournament incentives)	
Negotiation (i.e. based on bargaining power)	
Combination of elements above (please state specific combination)	
Other (please state)	

For the companies using an external reference group, please answer the questions below:

	Please provide requested information
Provide typical range of number of companies in the reference group (lower towards upper quartile)	...to...
Companies using cross industry versus companies using	…% cross industry versus …% industry

industry specific group (please provide percentages; if a combination applies please also provide figures for this combined approach)	specific
Companies using a national versus international group (please provide percentages)	…% national versus …% international group
Pay is typically referenced at lower quartile, median, upper quartile (or in between, please state?)	

Question 4

When dividing total direct compensation in basic salary, annual bonus and long-term incentive, what are the lower quartile, median and upper quartile target and maximum bonus and the expected value of long-term incentive as a percentage of basic salary? Please fill in the tables below for the CEO position and executives on board level:

CEO	Target bonus	Maximum bonus	Annual long-term incentive expected value	Ratio fixed versus variable pay (TDC)
Lower quartile	%	%	%	…% versus…%
Median	%	%	%	…% versus…%
Upper quartile	%	%	%	…% versus…%

Other Executive Board Members	Target bonus	Maximum bonus	Annual long-term incentive expected value	Ratio fixed versus variable pay (TDC)
Lower quartile	%	%	%	…% versus…%
Median	%	%	%	…% versus…%
Upper quartile	%	%		…% versus…%

B) Design of short-term incentive plan

Question 1

How does the short-term incentive pay out? Please fill in the table below:[142]

Type of payment under the annual bonus plan	Percentage of total sample
Cash	%
Shares	%
Combination of cash and shares	%
Other	%

[142] Bonus conversion plans not to be included.

Total	**100%**

Question 2

Number of financial performance measures. Please fill in the table below:

Number of measures governing payment	Percentage of total sample
One	%
Two	%
Three	%
Four	%
More than four	%
Total	**100%**

Question 3

Type of performance measures. Please fill in the table below:

Type of measures	Percentage of total sample
Sales/revenue	%
Operating profit/EBIT(DA)	%
Net profit	%
Earnings per share (EPS)	%
Cash flow	%
Economic profit	%
Return on equity (ROE)	%
Return on invested capital (ROIC)	%
Absolute Total Shareholder Return	%
Relative Total Shareholder Return	
Other, i.e.:………………..	%
Total	**100% can be exceeded due to use of multiple measures**

Question 4

Target setting financial measures. Please fill in the table below:

Target setting approach	Percentage of total sample
Budget	%
Year on year growth	%

Management expectations (often higher than conservative budget)	%
Relative to peer group	%
Timeless standard	%
Total	**100%**

Question 5

Use of non-financial targets including personal targets. Please fill in the table below:

Non-financial measures	Percentage of relevant sample
Of the companies that use non-financial targets, which % of the target bonus is typically related to these targets?	%
How many companies use non-financial targets?	%
Of the companies that use non-financial targets how many companies use personal non-financial targets (versus company non-financial targets such as client satisfaction)?	%

C) Design of long-term incentive plan

Question 1

Delivery vehicle. Please fill in the table below:

Type of vehicle	Percentage of total sample
Cash	%
(phantom) Options	%
(phantom) Shares	%
Combination of options and shares (please also provide typical ratio between options and shares)	%
Other, i.e.:…………	%
Total	**100%**

Question 2

Settlement of equity-based vehicles. Please fill in the table below:

Settlement	Percentage of total sample
Cash	%
Equity	%
Total	**100%**

Question 3

Use of quantitative (typically financial) performance conditions to grant/vesting of long-term incentive. Please fill in the table below:

Performance conditions	Percentage of total sample
At grant	%
At vesting	%
No (quantitative) performance conditions	%
Total	**100%**

Question 4

Number of financial performance measures. Please fill in the table below:

Number of measures governing payment	Percentage of total sample
One	%
Two	%
Three	%
Four	%
More than four	%
Total	**100%**

Question 5

Type of performance measures. Please fill in the table below:

Type of measures	Percentage of total sample
Sales/revenue	%
Operating profit/EBIT (DA)	%
Net profit	%
Earnings per share (EPS)	%
Cash flow	%
Economic profit	%
Return on equity (ROE)	%
Return on invested capital (ROIC)	%
Absolute Total Shareholder Return	%
Relative Total Shareholder Return	%
Other, i.e.:…………..	%
Total	**100% can be exceeded due to use of multiple measures**

Question 6

Target setting financial measures. Please fill in the table below:

Target setting approach	Percentage of total sample
Budget	%
Year on year growth	%
Management expectations (often higher than conservative budget)	%
Relative to peer group	%
Timeless standard	%
Total	**100%**

If other, please specify::…………………………….

Question 7

Is share ownership stimulated in your country (other than by individual companies at their own instigation? How is this stimulated? (i.e. guideline to own X% of basic salary in shares, holding requirements etc.). Please fill in the table below:

	yes/no	Explanation (refer to guideline/best practice provision and the way ownership is stimulated)
Through (national) corporate governance code		
Through institutional investor platform		
Other?		

Chapter 3

Executive Remuneration Structure and the CompRisk Index

3.1 Introduction

The objective of this book, is to add to the managerial compensation contracting literature in three ways: i) Open the black box of the executive remuneration decision; ii) Capture the executive remuneration structure in a single quantifiable yardstick; iii) Work with a new and potentially unique dataset on profit centre head remuneration. In this research chapter, I focus on the second approach mentioned. The objective is to develop a single quantifiable metric that captures the essence of the executive remuneration structure. It is intended as input for (future) empirical research as well as for practical use by the remuneration committee to make more informed decisions. In this introduction, I first focus on the question of whether the structure of compensation contracts matters. Subsequently, the research questions are formulated and an overview of the areas of research is provided.

3.1.1 Does remuneration structure matter?

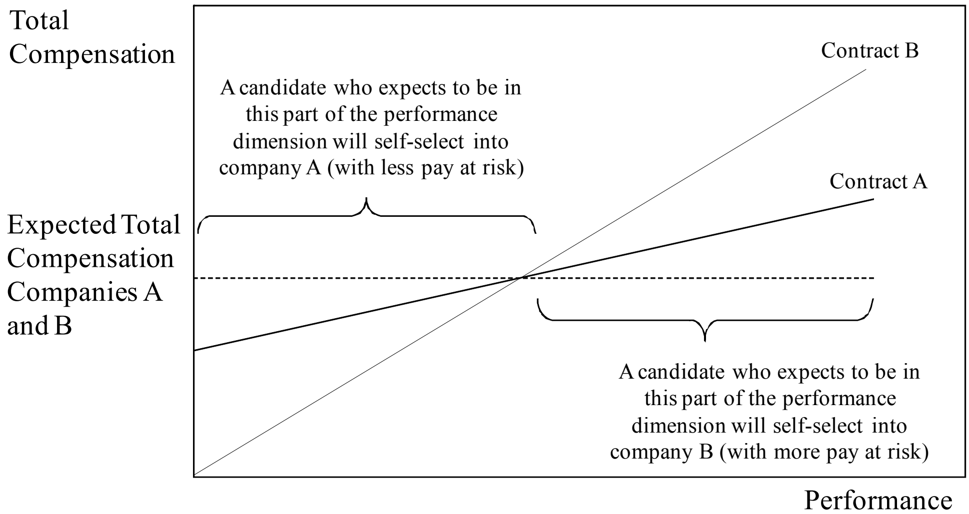
Within the agency literature, contract theory has focused on contractual solutions to the principal's problem: adverse selection and moral hazard. Adverse selection relates to attracting the right candidate. As discussed in chapter 2, one can mitigate this problem by the compensation structure. Adverse selection theory teaches that if a candidate with entrepreneurial spirit (and a relatively low risk profile) is sought, one must then design the contract so as to ensure that the right candidate will 'self select' into the job. Whether or not the agent 'signs up' for the upcoming performance period, depends on the offered contract. The level of risk in the contract is a proxy for the remuneration structure. The self-selection mechanism is corroborated by empirical evidence from Grund and Sliwka (2010), based on a representative dataset of the inhabitants of Germany. In their study on performance pay and risk aversion, they show that the willingness to take risks differs significantly among individuals.[143] Risk-averse individuals apply for jobs where performance-contingent pay is less likely. In conclusion, from the

[143] That individual characteristics matter in risky choices has been demonstrated by Kahneman and Tversky (1979, 1992). From an economic/mathematical perspective, risky decisions are governed by the product of probability and utility, called expected utility (Bernoulli, 1738; Edwards, 1954). Psychological experiments have shown that participants often prefer a sure thing of \$W (paid at probability $P = 1$) over a gamble for a larger amount \$J (paid at probability $P < 1$, while \$0 is paid at probability $1 - P$) even when the expected utility (U) of each option is equal ($W * P = J * P$). This leads to the conclusion that risk taking is governed more by the concern for loss than the desire for gain.

perspective of adverse selection, pay structure matters because it influences behaviour (here the choice for a certain job).

Figure 3.1: Self-selection as a result of the shape of the remuneration structure

This figure shows two contracts with equal expected costs for the company. Based on the perception of the value of the contract for the CEO candidate, a choice is made by him between more security, contract A, or more risk, contract B.



The structure of the contract is furthermore important with regard to the issue of moral hazard. Through a combination of fixed pay (security) and compensation contingent upon defined performance levels (risk), shirking is discouraged and the agent is induced to find and execute projects with a positive net present value. This implies that the level of compensation risk is a proxy for the overall compensation structure.

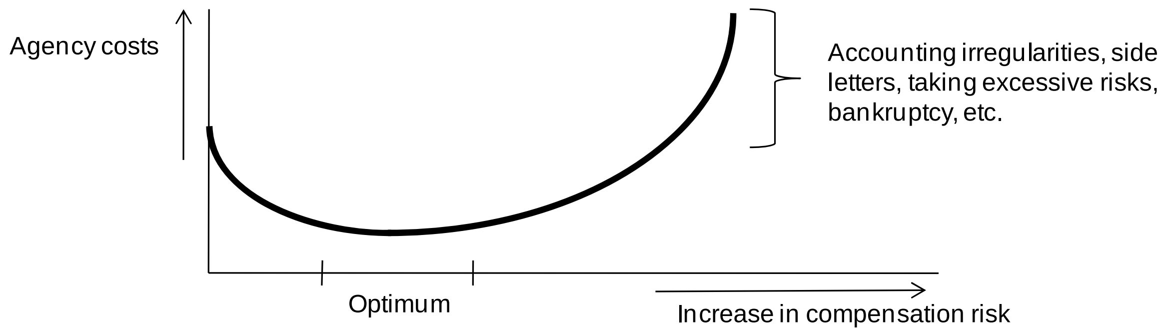
This gets us to the question whether incentives drive behaviour. The literature on pay and performance variability (managerial risk taking) confirms that it does. Coles et al. (2006) show a strong causal relation between managerial compensation structure and operational decisions. A higher sensitivity of CEO wealth to stock volatility (vega) results in implementing a riskier policy (more R&D investments, fewer investments in property, plant & equipment, higher leverage, greater focus on fewer segments). That the structure of incentives can induce risk taking, for example resulting from the sensitivity of compensation to stock-price volatility (Guay, 1999),[144] has also been ascertained by Agrawal and Mandelker (1987) and DeFusco et

[144] Guay (1999) highlights the difference between the slope of the relation between manager's wealth and stock price (delta) and the convexity of the relation, which is the sensitivity of the manager's wealth to stock return volatility (vega). Increased delta exposes managers to more risk, while increased vega helps

al. (1990) for the general industry and by Chen et al. (2006) for the banking industry. Providing incentives to take risk can be a value-enhancing decision as shown by Rajgopal and Shevlin (2002) for the oil & gas industry[145] and risk reduction can be a value-destroying action as shown by Low (2009) for Delaware companies.[146] However, risky incentives can also result in 'swinging for the fences' (big losses and big wins), without additional average return for the company (Sanders and Hambrick, 2007), or it can cause managerial decisions to become unduly influenced by a risk-averse predisposition, harming the interests of external shareholders (Wright et al., 2007). Remuneration committees must therefore find an optimal level of incentive strength. Figure 3.2 provides a graphic representation of this choice.

Figure 3.2: Agency costs - optimal zone

This figure shows that in terms of incentive strength (/compensation risk), there is an optimal area, where agency costs are minimised. Going beyond that point, by providing the CEO with increased incentives / risk, can create a situation of increased agency costs.[147]



Incentives should be strong enough to ensure that valuable but risky investments are made. However, if incentives are too strong, this can result in undertaking opportunistic actions, such as earnings management and timing the release of information. This can boost the likelihood of fraud allegations (Aboody and Kasznik, 2000; Chauvin and Shenoy, 2001; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Efendi et al, 2007; Denis et al., 2006), hereby

offset the aversion to risky projects that arises due to the increased delta. Coles, Daniel and Naveen (2006) find that the direction of causality runs both ways. Riskier firms are more likely to increase CEO portfolio delta and vega, and increased delta and vega lead to riskier firm policies and higher firm risk.

145 Executive stock options reduce the managerial incentive problem, by motivating them to invest in risky, positive NPV projects (e.g. to overcome exploration risk measured by exploration activity).

146 Legal protection in the state of Delaware against hostile takeovers (1995).

147 The Dutch Corporate Governance Code, also implicitly assumes an optimal area. This can be illustrated by the evolving debate in the Netherlands. Best practices II.2.1 and II.2.3 of the Dutch Corporate Governance Code (2003) require companies to link performance conditions to their option and share plans. Ceteris paribus, such conditions increase compensation risk. A few years later, the committee that monitors compliance with the Code indicates in recommendation 19 of its report (2007) that pay should be capped beyond a certain point (to be determined by the company). Under the assumption of a fixed value approach this would decrease compensation risk.

increasing rather than decreasing agency costs (Jensen, 2004, 2005). We conclude that the structure of remuneration incentives matter.

Types of incentives

There are different types of incentives. A basic dichotomy is based on the difference between portfolio- and performance-incentives. The first category refers to the structure of the CEO's portfolio of stock options and shares, which are (assumed to be) part of his wealth. The sensitivity of CEO wealth to share price movements (delta) and to share return volatility (vega) has been widely researched analytically and empirically, among others Hemmer et al. (1999), Guay (1999), Core and Guay (2002) and Coles et al. (2006). Note that a related stream of research focuses on the implications of the magnitude of the portfolio on the value of compensation, from the perspective of the executive. It concludes that if a risk-averse manager has a significant part of his wealth tied to his firm's stock price the certainty equivalent value of that compensation contract can be substantially less than its cost as perceived by shareholders, e.g. Lambert et al. (1991), Hall and Murphy (2002).

The second category refers to the structure of unvested rights, including the short-term incentive and the long-term incentive plans. In comparison to the first category, there is a fundamental difference. Shares and option portfolios in the first category can be directly linked to share price movements and return volatility. In contrast, the assessment of performance-incentives follows a two-staged approach. The underlying option and/ or share vehicle needs be taken into account, but even more important is the performance condition. It determines whether or not there will be an addition to the portfolio or not. Such a performance condition can become quite elaborate, such as the requirement to outperform 50% of the companies in a peer group, based on relative total shareholder return. I will focus on the details of such performance contract from an ex ante perspective and from the perspective of the principal that offers the contract to the agent.[148] Note that the ex post perspective has been covered by the pay-for-performance literature; i.e. what are the determinants of realised pay? These types of correlation studies are particularly apt to provide evidence in respect of the question of whether pay is sensitive to the achieved level of performance (e.g. Jensen and Murphy, 1990a, b; Mehran, 1995; Coughlan and Schmidt, 1985; Lewellen et al., 1987; Agrawal et al.,1991; Goldberg and Idson, 1995; Aggarwal and Samwick, 1999; and Core et al., 1999). However, at the moment of realisation, the package is no longer at risk which provides little insight in the 'at risk' character of the package.

[148] It is not the objective to value the contract from the perspective of the executive (certainty equivalence approach). This would involve making assumptions on the risk preferences of the CEO. In contrast, the goal is, based on the perspective of the company and based on the valuation tools that are used in practice for IFRS 2 accounting, to establish a consistent measure that can capture the structure of the remuneration policy.

Therefore, the essence of the structure of performance incentives equals the level of risk the agent faces at t=0. Duffhues and Jobsen (2006) state that the development of a risk-return model could enhance insight into executive pay practices. Developing such measure could add to the understanding on both the moral hazard as well as the adverse selection issue. The objective is therefore to create such a single quantifiable yardstick, which I call the CompRisk index (CRI), explore its use and research its determinants.

3.1.2 Research questions

The research questions are based on this conclusion and are reflected in table 3.1.

Table 3.1: Research questions

This table provides an overview of the research questions of this chapter, the objectives, and the reference to the relevant section.

Research questions	Objectives	Section
1) How to define a single quantifiable metric that can capture the structure, risk, or incentive strength of yearly compensation contracts?	The typical definition of compensation at risk is expressed in terms of pay mix, i.e. the percentage of variable compensation. The objective is to improve this proxy by taking into account additional contract information (the structure of remuneration).	3.2
2) What is the level of risk in real-life compensation contracts in the Netherlands and the UK?	We will execute CRI calculations and simulations for a dataset of large listed Dutch and UK companies. Our objective is to describe the landscape of remuneration structures in terms of the observed difference in compensation risk. What are typical ranges? Are these different for the Netherlands versus the UK?	3.3
3) How can the CompRisk index be used?	Because the economic consequences of incentives can be significant, our objective is to increase the likelihood of measuring compensation risk in a practical context. We take a step towards reduction of time and complexity of the CRI. In addition, a benchmark matrix is provided and the link with the Sharpe ratio is discussed.	3.4
4) What are the determinants of compensation risk, as measured by the CompRisk index?	We explore how the tool can be used for future research and we take a first step by researching the determinants of the CompRisk index (individual, company, industry, country and time effects).	3.5

3.1.3 Research structure

Research questions 1 to 4, as reflected in table 3.1, are answered in section 3.2 to 3.5. Section 3.6 provides a summary (3.6.1) and conclusion (3.6.2) as well as a subsection on future research (3.6.3).

3.2 Development of the Compensation Risk Index (CRI)

In this section the CompRisk Index (CRI) is developed. The proxy for compensation risk that is built on, is the extent to which an executive's compensation package depends upon ex-post states of the world (Gray and Cannella, 1997). The pay mix reflects the proportion of total pay that is at risk. However, it does not take the underlying pay structure into account. I propose an amended approach in which the weight of variable pay is taken as the starting point and contract details relating to the underlying pay structure are added. This approach is relevant based on the observation that we cannot classify pay as a binary variable based on how the company categorises pay (i.e. fixed versus variable). Within the proportion of so called 'variable pay', part of it is actually at risk and the other part can in fact be classified as fixed compensation (with differences per company).

Our proxy is based on the extent to which variable pay is really at risk. It is based on the coefficient of variation, which measures the variation around the expected pay level (statistical dispersion measure). By way of example, I briefly digress to payout risk in the context of a lottery. Assume there are three lotteries, each with 10 possible outcomes, as reflected in table 3.2.

Table 3.2: Lottery payments in different states of the world

This table shows the payments in different states of the world of lottery A, B, and C. The assumption is that only 10 possible states of the world exist. μ is the average payment and σ the payment population standard deviation.

State of the world	Lottery A	Lottery B	Lottery C
1	1,000,000	200,000	100,000
2	0	200,000	100,000
3	0	200,000	100,000
4	0	200,000	100,000
5	0	200,000	100,000
6	0	0	50,000
7	0	0	50,000
8	0	0	50,000
9	0	0	50,000
10	0	0	50,000
	μ = 100,000	μ = 100,000	μ = 75,000
	σ = 300,000	σ = 100,000	σ = 25,000
	σ/μ = 3	σ/μ = 1	σ/μ = 1/3

Lottery A and B have an equal expected payout value (μ = 100,000). Lottery A, however, has higher variability as measured by the standard deviation (σ), but also offers the opportunity to win a much higher amount; 1,000,000 (with 10% probability) versus 200,000 in lottery B (with 50% probability). Lottery C is an atypical lottery as it provides for a minimum reward of 50,000. It furthermore has a lower average payout than lottery A and B, but also much more security in view of the coefficient of variation of 1/3 versus 3 for lottery A and 1 for lottery B.

Which lottery ticket would you buy, assuming you could pay for it with your own human capital? This is the question a candidate for a chief executive position must answer. Comparing only the expected level of compensation provides too little information to make such a decision. The executive is confronted with a trade-off between the expected pay level, on the one hand, and the risk in the actually paid out compensation (ex post), on the other. This ex-ante level of pay equals the average of possible future outcomes (ex-post pay level). The degree to which the ex-post realisations of pay can deviate from this expected level are captured in the standard deviation.

In the remainder of the text, the coefficient of variation times 100 will be referred to as the CompRisk index or CRI. We will focus on the direct compensation elements (i.e. benefits are not taken into account[149]) and differentiate between fixed compensation and the various forms of variable compensation. In order to calculate the CRI for each element, we need the weight in the total package and the coefficient of variation per compensation element.

3.2.1 Fixed compensation

The amount of fixed compensation in the total package equals security. The greater the amount of fixed compensation, the lower the risk for the executive, resulting in a higher operating leverage for the firm. Fixed compensation mainly consists of the basic salary including fixed elements, such as vacation allowance and additional end-of-year payments. We incorporate the weight of basic salary into our calculation of the CRI. The coefficient of variation equals zero.

---

[149] Examples of benefits are a company car, golf-club membership, etc. Typically, the most important benefit is the pension. There is a great deal of noise regarding the disclosure of pensions over the research period (2001-2008). From the Dutch perspective, individualised disclosure of pensions at the beginning of the research period was virtually nonexistent. The disclosure of pensions has improved over the years. However, differences remain in actuarial assumptions, deviations between companies that disclose the average population premium versus a CEO-specific premium etc. Similar situations have been observed in other countries. Bebchuk and Jackson (2005) scrutinise the non-transparency of pension pay in the U.S. If transparency improves, research will be better able to take pension values into account. The conclusion of Kalyta and Magnan (2008) for Canada can be extended to other jurisdictions as well. They indicate that vague disclosure of supplemental executive retirement plans (SERPs) may impede effective shareholder monitoring of this part of compensation.

Severance pay can also be perceived as a form of fixed compensation. It is the payment that is made if the CEO is asked to leave the company. One would be able to observe the realised amount at the moment the CEO leaves. However, we are not interested in severance pay from a realised actual-value (ex-post) perspective but from a potential expected-value (ex-ante) perspective. The situation in which severance is paid is difficult to assess upfront (bad performance over one year, bad performance over several years, change in supervisors, change in shareholders, crisis, internal affairs, external factors,[150] etc.). The amount is furthermore difficult to assess. Severance is not often defined upfront as a certain amount. It is typically determined in terms of a maximum amount (but with a hardship clause[151]). To limit the noise level in the index, severance pay is not directly incorporated in the left-hand-side variable.[152]

3.2.2 Variable compensation

Variable compensation typically consists of a short-term incentive plan (STIP) and a long-term incentive plan (LTIP). The STIP is based on annual performance and is typically paid out in cash.[153] The long-term incentive plan for listed companies is typically in shares and/or in options and linked to a predetermined and measurable performance condition.

In chapter 2 variable pay programs were discussed in relation to the trade-off between risk and distortion (Baker, 1992; Baker, 2002). A measure that is fully aligned with the goal of the company (long-term value creation) tends to be more difficult to directly influence than measures that are further away from this objective. I will take 'cost efficiency' as an example.

---

[150] For example, the (unexpected) oil leakage in U.S. territorial waters resulted in the dismissal of BP's CEO (2010).

[151] A hardship clause allows for deviation of the provision if the outcome would turn out to be unreasonable. The Dutch Corporate Governance Code also leaves room for such situations in best practice provision II.2.8: "The remuneration in the event of dismissal may not exceed one year's salary (the 'fixed' remuneration component). If the maximum of one year's salary would be manifestly unreasonable for a management board member who is dismissed during his first term of office, such board member shall be eligible for severance pay not exceeding twice the annual salary."

[152] An alternative way of taking the contract termination clause into account, is to include it as a right-hand-side variable in the regression analyses in section 3.5. This offers an ex-ante perspective and answers the question whether the risk in the 'going concern' package is a communicating vessel with upfront negotiated 'soft landing' conditions (i.e. higher compensation risk if severance pay and notice period are relatively generous). The standard models as reflected in section 3.5 do not take this into account. A separate regression was executed in which a 'parachute' dummy and the 'notice' period was included (see appendix 3.1 for a definition of both variables). It did not result in a rejection of the null hypothesis that the coefficients equal zero. This may be explained by the fact that corporate governance codes have been a force towards uniformity. For example: Best practice provision II.2.8 of the Dutch Corporate Governance Code (2003, 2008) states: 'Remuneration in the event of dismissal may not exceed one year's salary (the 'fixed' remuneration component). If the maximum of one year's salary were manifestly unreasonable for a management board member who is dismissed during his first term of office, such a board member shall be eligible for severance pay not exceeding twice the annual salary. Companies that seek to comply with this provision follow this guidance.

[153] If the bonus is paid out in shares, there is typically a matching feature linked to it. This component is taken into account under the long-term incentives (in practice often referred to as 'mid-term incentive').

Cutting costs can be quite easy. You can start with firing your best paid employees, cut back on R&D expenses etc. However, it could be that your best paid employees are also the most valuable employees, and that cutting back on R&D will deteriorate your market position in the longer run. Making decisions in light of value creation, in a listed firm eventually measured by total shareholder return, is associated with uncertainty: are your actions today, right for the future?, will this be acknowledged by the market?, etc. Therefore, a variable pay design that is fully aligned with the goal of the company exhibits more risk (less direct influence by the CEO on the outcome). In reality, this payment risk is reduced in order to keep executives motivated. However, this cannot be done without introducing more distortive measurement (away from the company's eventual goal). In a classic management paper, Kerr (1975) indicates that there are many examples of reward systems where the behaviours that are rewarded are those which the rewarder is trying to discourage, while the behaviour he desires is not being rewarded at all: 'The folly of rewarding A, while hoping for B'.

Variable pay packages thus strike a balance between risk and distortion. This implies that remuneration committees select items from both the left- as well as the right-hand column of table 3.3.

Table 3.3: Overview of pay design – risk versus distortion

This table shows the trade-off between risk and distortion. Risk, for the executive, is lower if there is a greater direct impact of his actions on the outcome of the performance measure or payment vehicle. Distortion is lower if the measurement is more in line with the eventual goal of the company (i.e. long-term value creation).

Low risk - high distortion	High risk - low distortion
Short-term focused measurement	Long-term focused measurement
Individual performance measures	Group performance measures
Accounting/internally based performance measures	Value-based/external performance measures
Relative performance measures	Absolute performance measures
Multiple measures	Single measure
Cash-based vehicles	Equity-based vehicles

From an overall variable-pay perspective, short-term incentives are typically composed of items from the left and long-term incentives of items from the right-hand column.[154] For listed companies, the performance measurement related to the LTIP is typically 'outsourced to the share market'. Because there is less room for power as an explanatory variable of ex-post outcomes, one is able to simulate potential LTI outcomes based on performance. Short-term incentives are internally driven and one needs to cut through company culture as well as

[154] If the long-term incentive becomes too risky, items from the left column are introduced. An example is relative measurement within total shareholder return plans. It reduces noise in determining CEO performance.

‘camouflage’ (Bebchuk, 2004) to be able to say anything about payout variation. Both STI as well as LTI are further discussed in the next two subsections. I will operate within the boundaries of the International Financial Reporting Standards and especially IFRS2 on share-based payments.

3.2.2.1 Short-term incentive

A short-term incentive plan rewards performance achieved over a one-year period. The typical structure of a short-term incentive plan is described in chapter 2, section 2.2.3. Bonus contracts include financial as well as non-financial measures, collective as well as individual measures, objective as well as subjective elements. Underlying targets can be based on budgets, year-on-year growth (delta approach), timeless hurdles, or relative performance measurement. Combining payout under the different performance conditions can occur based on different methods such as the addition method, the multiplication method or the matrix approach.[155] Finally, the remuneration committee has the discretionary power to adjust the bonus upward or downward under special circumstances. Disclosure of the STI contract structure is limited, and the associated yearly targets are often considered commercially sensitive and not disclosed upfront. Estimating payout variation based on contract information is therefore impossible in most cases.

The weight of the (expected/average) STI can be based on the policy (target) STI level. Since the structure is unknown, variability of STI payouts can be taken into account based on two approaches:

1. Assume a uniform distribution; the coefficient of variation within the uniform distribution equals: ((maximum – minimum)/square root of 12)/((minimum + maximum)/2). Because the minimum bonus is zero, any given maximum level results in a coefficient of variation of 0.58 (Evans et al. 2000). The CRI for the short-term incentive would thus be 58;
2. Make a prediction of potential payout variation for the upcoming year based on the coefficient of variation of the actual bonus payouts over the past years.

---

[155] If the bonus plan has multiple measures to define the performance of the CEO, there are various ways to combine the results on each of the performance areas, in order to establish the eventual bonus payment: i) *The additive approach* combines the bonus earned under each performance measure but simply adding up the results. A bad result on one of the measures can be compensated by a good result on a different measure. This method reduces risk for the CEO; ii) *The multiplication approach* combines the bonus under each performance measure by multiplying the results. A growth measure, for example, can be combined with a return measure. If the score on one of the two is bad, this impacts the bonus result on the other measure as well. This approach increases the risk for the CEO; iii) *The matrix approach* can further refine the multiplication method by way of combining the results on performance measures. It can, for example, define a minimum score for each of the measures under which there is no payment at all. This approach, depending on its use, can further increase the risk for the CEO.

The first alternative mentioned, emphasises the parts of the model for which information is available; the weights of the various compensation elements (basic salary, STI and LTI) as well as the structure of the LTI (see the next section 3.2.2.2). Such a proxy of compensation risk improves the proxy I build on, as it reflects additional information (not so much from the perspective of the STI as from the perspective of the LTI, discussed later).

The second alternative mentioned, has the potential to further improve the proxy because it takes firm-specific elements for the STI into account. It can reveal the extent to which the STI is actually at risk. Given the specific role of the STI in the remuneration package (lower risk at the price of higher distortion), one can make a case for using this proxy even if there is full information at t=0 about the STI structure. This is because the ex-ante incentive structure does not always have a deterministic relationship with the ex-post outcome. Given the fact that the STI process (determining performance measures, setting targets and establishing the payout) takes place behind closed doors, there is significant freedom to reward good performance, but also what could be considered bad performance. As set forth in chapter 2, this can be based on the fact that targets are deliberately set at an easy level (pay-for-performance culture is less strict) or on the information asymmetry between the CEO and the remuneration committee. In other words, company-specific elements play an important role.

This results in the desire to establish payout variation based on actual results. This approach observes actual behaviour and not what is communicated about the STI upfront. It therefore cuts through the company-specific performance culture and 'camouflage'. Such an approach is (implicitly) supported by: behavioural economics (such as the work of Nobel Prize laureate Daniel Kahneman[156]), research findings that establish insignificant or even negative association with performance (e.g. Duffhues and Kabir, 2008), the specific role of the STI in the remuneration package (lower risk and higher distortion), and my personal experience as a board room consultant. The following two examples from the dataset also promote this approach.

The first example relates to a Dutch company, referred to as XYZ1. As a result of the introduction of the Dutch Corporate Governance Code, increased disclosure is observed on remuneration, starting in 2004. With regard to the short-term incentive plan, page 11 of the annual report in that year states:

[156] For an overview essay of the work of Kahneman for which he was awarded The Bank of Sweden Prize in Economic Science in Memory of Alfred Nobel in October 2002, refer to Rabin (2003).

'In addition, there is short-term variable remuneration at a maximum of 50% of the fixed salary. Objective, measurable financial targets are agreed in advance for this variable remuneration. These targets are not made public, for commercial and competitive reasons'.

Starting the following year (2005), the annual report provides a comment with regard to the earned bonus amount as reflected in table 3.4.

Table 3.4: STI payout over the period 2005-2008 (CEO of XYZ1)

Year	Payout as a % of basic salary	Comments in the annual (remuneration) report of the company in the specific year
2008	50%	"In 2008 the CEO received the maximum results-linked remuneration in respect of 2007, amounting to 50% of the annual salary, having comfortably met the specified performance criteria."
2007	50%	"In 2007 the CEO received the maximum results-linked remuneration in 2006, amounting to 50% of the annual salary, having comfortably met the specified performance criteria."
2006	50%	"The CEO received results-linked remuneration in 2006 amounting to 50% of annual salary as a result of having comfortably exceeded the specified performance criteria."
2005	50%	"The CEO received a bonus of 50% of salary as a result of having comfortably exceeded the specified performance criteria."
Coefficient of variation:	0,00	

The coefficient of variation in the bonus payout is zero in these years. This raises the question of whether the performance variation also equals zero for these years. Table 3.5 provides an overview of a number of different ways to measure performance.

Table 3.5: XYZ1 performance over the period 2005-2008

This table shows the performance of XYZ1, measured in terms of net income growth (%), return on assets (%), return on equity (%) and Tobin's Q. Source: CapitalIQ

	Net income growth	Return on assets	Return on equity	Tobin's Q
2008	10.13	5.98	15.10	1.01
2007	-38.95	6.40	16.91	1.26
2006	149.18	5.88	36.15	1.53
2005	29.24	5.42	18.58	1.56
Coefficient of variation:	2.14	0.07	0.45	0.19

The average payout variability is 0.71 ((2.14 + 0.07 + 0.45 + 0.19)/4). With a 1-year time lag, this figure would be 0.66. This is not in line with the zero variability of the STI payouts. Payout variation does not seem to follow performance variation for this company.

Let's look at a different example: The Dutch company XYZ2. With regard to the short-term incentive plan, page 63 of the annual report (2005) states:

'With effect from 2005 the bonus scheme has been linked solely to financial performance criteria, i.e. net income and return on assets (ROA). The maximum level of the bonus that can be earned has been fixed at 50% of base salary. The extent to which the set targets have been achieved is partly determined on the basis of the annual financial statements as verified by the external auditor'.

Table 3.6: STI payout over the 2005-2008 period (CEO of XYZ2)

Year	Payout as a % of basic salary	Comments in the annual (remuneration) report of the company in the specific year
2008	0%	"The Remuneration Committee held four meetings in 2008. Matters discussed by the committee included the fixed and variable pay components of the members of the Board of Executive Directors based on the remuneration policy for the Executive Board that was approved by the General Meeting of Shareholders in 2004. For the 2008 financial year, no variable pay has been granted."
2007	49%	"The Remuneration Committee held two meetings in 2007. Matters discussed by the committee included the fixed and variable pay components of the members of the Board of Executive Directors based on the remuneration policy for the Executive Board that was approved by the General Meeting of Shareholders in 2004."
2006	20%	"The Remuneration Committee held one meeting in 2006. Subjects discussed by the committee included the fixed and variable remuneration of the members of the Board of Executive Directors in accordance with the remuneration policy for the Executive Board that was approved by the General Meeting of Shareholders in 2004."
2005	39%	"At the meeting in January 2005 the number of shares to be granted in conformity with the share plan was determined, the targets for 2005 were discussed and the variable pay for 2004 was established on the basis of the previously set targets."
Coefficient of variation:	0,81	

The coefficient of variation of the bonus payout in these years is 0.81 (or 81%). Table 3.7 provides an overview of a number of different ways to measure performance.

Table 3.7 performance XYZ2 over the period 2005-2008

This table shows the performance of XYZ2, measured in terms of net income growth (%), return on assets (%), return on equity (%), and Tobin's Q. Source: CapitalIQ.

	Net income growth	Return on assets	Return on equity	Tobin's Q
2008	-97.45	0.85	0.30	0.85
2007	40.24	3.22	11.32	1.15
2006	-31.17	2.76	7.88	1.15
2005	2.31	3.60	11.21	1.12
Coefficient of variation:	2.71	0.47	0.67	0.14

The average payout variability, as measured by the coefficient of variation, is 1 ((2.71 + 0.47 + 0.67 +0.14)/4). With a 1-year time lag, this number would be 0.89. This is more in line with the STI variability than is the first example.

The example shows that different performance measures exhibit different variability. In the first example the coefficient of variation of return on assets is most comparable to the payout variability of the STI. In the second example, this is the case for a different measure, i.e. return on equity. Thus, working with a specific performance measure as a proxy for STI payout variability is less valuable than working directly with the observed payout variability.

More important, the example confirms that companies are not alike. Some companies strictly follow the pay-for-performance adage and other companies do not. This is tied to company-specific factors, such as corporate culture. There will be low payout variation at companies that apply a budget approach as the way to set targets, where a modestly performance-driven corporate culture exists and where the CEO has power over the remuneration committee (there is discretionary room to smooth bonus payouts). At other companies, which, for example, use a year-on-year growth approach for setting targets, where a highly performance-driven culture exists and where the remuneration committee is strict in following targets, payout variation is expected to be higher (to follow performance variation). This supports the use of historical data to establish a company-specific proxy. Historical evidence can show whether companies are more likely to be situated in one category or another. After all, companies can claim they adopted the pay-for-performance principle, but do they actually 'put their money where their mouth is'? In terms of the length of the historical period, we apply the four-year period as described in best practice provision II.1.1 of the Dutch Corporate Governance Code (2008) regarding the term in office.[157] As a robustness check, the analyses will also be executed for a period of 3 and 5 years.

To get an initial understanding of the level of compensation risk observed in the Dutch and UK sample, I have clustered the companies in four categories. The clusters are based on the criterion to minimise Z.

$$Z = \frac{\sum_{i=1}^{N_i} \left| CR_i - \frac{\sum_{c \in A_i} CR_c}{M} \right|}{N} \qquad \textbf{[3.1]}$$

Where:

- CR_i = the compensation risk calculated for company-year observation 'i'
- CR_c = the compensation risk calculated for company-year observation 'c'
- A_i = cluster of which observation i is a part
- i = 1, 2,…N (all observations)
- M = the total number of observations in cluster A_i
- $c \in \bigcup_{i=1} A_i$
- c = 1,…M
- $A_i \cap A_j = 0$

Minimising Z, implies that for each observation 'i', we extract the average of the cluster (c equals the index of observations in the cluster of which observation i is a part (Ai) and M equals the total number of observations in that cluster). Clusters have no overlap. Based on moving boundaries (repeated 63,960 times), the optimal boundaries are obtained where Z is minimal.

The boundaries show minor variations between historical periods of different lengths (3, 4 and 5 years) as well as for the Dutch and UK samples. We use the exact figures for the regressions and provide a guide for intuitive use below (based on the 4-year historical period).

Table 3.8 STI clusters

This table shows the lower and upper boundaries of the four short-term incentive plan clusters, as well as the proportion of the sample that is categorised in cluster 1, 2, 3, and 4. For example, it shows that 36% of

[157] 'A management board member is appointed for a maximum period of four years. A member may be reappointed for a term of not more than four years at a time'.

the observations are part of cluster 1, with a CRI between 0 and 25. CRI stands for 'Compensation Risk Index'.

Cluster	CRI - Lower boundary	CRI - Upper boundary	Proportion of sample
1	0	25	36%
2	25	50	34%
3	50	100	21%
4	100	200	9%

The clusters range from 'income smoothing' (cluster 1) to real pay-for-performance (cluster 4). There is no stationary state for all companies over the full research period.[158] This is only the case for thirty percent of the companies which remain in the same cluster over the entire research period. Because we are particularly interested in the predictive power for the upcoming one-year bonus cycle, we have also made a dynamic calculation. From one year to the next, companies stay in the same cluster or move to the adjacent cluster in 95.4% of the cases (58.7%-points in the same cluster and 36.7%-points to the next cluster up or down). Part of this serial correlation can be attributed to the fact that there is overlap in the used historical period. If a period of 4 years is taken to predict the variability at the beginning of 2009, the years 2008, 2007, 2006 and 2005 are used. For the beginning of 2008 the years 2007, 2006, 2005 and 2004 are used.

If a calculation is made without overlap, e.g. for the start of period 2009 (2008, 2007, 2006, 2005) and 2005 (2004, 2003, 2002, 2001), this figure equals 63.8%. I consider the first mentioned figure of 95.4% of higher relevance, given the fact that serial correlation is stronger if the difference in the time period is shorter. An analogy can be made with the weather. Particularly in the Netherlands, one cannot speak of a stationary state of the weather (different weather is observed during different periods of the year). However, if one needs to predict tomorrow's weather based on historical data, it is best predicted by today's weather. This logic of serial correlation is applied to payout variability; i.e. the best estimate for the upcoming year is based on the previous period. This period should be long enough to provide a robust figure. However, if it is too long it loses its autocorrelation (e.g. due to CEO turnover, change in members of the remuneration/selection committee, change in remuneration structure, change in company strategy, etc.).

[158] We thank prof. Kleijnen for the insight that it is impossible to know upfront when the stationary state will occur. The solution is to make time graphs and make a prediction based on these graphs.

The historical variation in the preceding 4 years is taken as a proxy for the upcoming bonus cycle. If the historical period is 'polluted' by a CEO change, the cluster in which the company is situated is used by taking the average value of the cluster as a proxy of the CompRisk_{STI}.

3.2.2.2 Long-term incentive

For the long-term incentive, the ex-ante compensation contract can typically be used to establish the CompRisk index, given the fact that contract details are often disclosed. A valuation methodology in line with IFRS 2 on share-based payment will be applied.[159] I will distinguish between the payout vehicle (cash, shares or options) and the performance measure. If the payout occurs in cash, there is no variation related to the vehicle. The payout variability fully depends on the performance measure. If the payout vehicle is in shares, the stock price is simulated at the end of the vesting period from the Geometric Brownian Motion, obtained by:[160]

$$S_t = e^X \qquad \textbf{[3.2a]}$$

$$X \sim Norm\left(\ln(S_0) + \left(\mu - \frac{1}{2}\sigma^2 \right) t, \sigma\sqrt{t} \right) \qquad \textbf{[3.2b]}$$

Where: t is the time period (based on the simulation period equal to the period in which the executive is exposed to the risk of share price movements), S_0 is the share price at t=0; S_t is the share price at time period t. Furthermore:

$\mu = \ln(1+r-\delta)$ in which r is risk free rate (based on the zero coupon government bond with remaining maturity equal to the relevant simulation period), δ is dividend yield (predicted based on a short historical period of 1 year and a longer period taking the average of 1, 3, 5 and 10 years), ln = natural logarithm;

$\sigma = \sqrt{Var\left[\ln\left(\frac{S_t}{S_{t-1}} \right) \right]}$ in which Var is the variance. The historical period used to predict future variance in the share price is a short historical period of 1 year ('alternative A') and, as an alternative, a longer period is used taking the average of 1, 3, 5 and 10 years ('alternative B').[161]

---

[159] In February 2004, the International Accounting Standards Board (IASB) issued the International Financial Reporting Standard (IFRS) 2 Share-based Payment. The effective date for applying the standard was 1 January 2005 for grants made after 7 November 2002 and not yet vested as of the effective date. The valuation rules used in practice and signed off on by the external auditor are applied in this chapter. These fair values provide the window frame through which stakeholders view share-based payments (including the CEO and the remuneration committee) and on which decisions are based.

[160] Refer to Stentoft (2004), among others.

[161] This is a robust form of estimation suggested by prof. dr. Kleijnen.

If not shares but options are used as a payout vehicle, we apply a two-staged approach. Until the vesting date, we simulate the share price as set out above (explicit 'at risk' period). After this period the executive is still exposed to share-price fluctuations as long as the options are not exercised (implicit 'at risk' period). To account for early exercise, the moment of exercise is estimated by taking the midpoint of the period between the end of the vesting period and the end of the contractual life. Over this period we will use the Black-Scholes formula (1973) as reflected in equation 3.3. In our research for the Corporate Governance Monitoring Committee (2007), we showed that this method correlates to a coefficient of 0.99 with the alternative binomial option pricing model first proposed by Cox, Ross and Rubinstein (1979).[162]

$$C = Se^{-\delta T} N(d_1) - Pe^{-rT} N(d_2) \qquad \textbf{[3.3]}$$

where C is the Black-Scholes value of a European call option as modified to account for dividends by Merton (1973); S is the price of the underlying stock at the valuation date; δ is the expected annual dividend rate over the life of the option; t is the time to maturity of the option in years; N is the cumulative probability function for normal distribution; P is the exercise price of the option; r is the annual risk free interest rate; $d_1 = [\ln(S/P) + (r - \delta + \sigma^2/2)T]/\sigma T^{1/2}$; σ is the expected annual stock return volatility over the life of the option and $d_2 = d_1 - \sigma T^{1/2}$.

Because simulations are based on 10,000 iterations, it is necessary also to construct 10,000 Black-Scholes values for a single grant. The split between the explicit and implicit at-risk period is particularly relevant if the vesting of the options is linked to a performance condition (instead of only an employment condition). The performance measure determines whether there is a second period or not and how many options are earned. Table 3.9 summarises the way performance measures have been taken into account.

Table 3.9 Simulation of performance measures

This table shows the equations that are used for the simulation of performance measures. Equation 3.2, which is also used for the simulation of share based vehicles, is used for the simulation of share price related measures: S_t is the share price at future time period 't'. Equation 3.4 shows the simulation of growth measures, based on the normal distribution. Average annual growth of earnings per share (EPS) is the most often observed measure in this category, and therefore taken as an example. Equation 3.5 shows the simulation of return measures, such as return on assets and return on equity, based on a normal

[162] Also refer to van der Laan (2009), page 96. The approach is furthermore in line with IFRS2 which requires a flexible model that can take into account factors that have a fair-value impact. Monte Carlo simulation is used for the explicit at-risk period. The period after vesting is relatively short (taking early exercise into account). IFRS 2 states under B5: In these instances, the Black-Scholes-Merton formula may produce a value that is substantially the same as a more flexible option-pricing model.

distribution. Equation 3.6 shows the simulation of absolute measures, such as revenue objectives, based on a log-normal distribution. Equation 3.7 shows the simulation of other measures, such as personal targets, which are simulated based on the uniform distribution. For all equations, the average is reflected by ‘μ’ and the standard deviation by ‘σ’. All simulations are based on the sample average and standard deviation.

Equation #	Distribution	μ	σ
[3.2] **Share price** S_t $S_t \in (0,\infty)$	$S_t = e^X$ $X \sim Norm\left(\ln(S_0)+\left(\mu-\frac{1}{2}\sigma^2\right)t,\sigma\sqrt{t}\right)$	$\ln(1+r-\delta)$	$\sqrt{Var\left[\ln\left(\frac{S_t}{S_{t-1}}\right)\right]}$
[3.4] **Growth (EPS example)** $EPS_t \in (-\infty,\infty)$	Average annual growth over *t* years: $E\left(\frac{EPS_t - EPS_{t-1}}{\lvert EPS_{t-1}\rvert}\right) \sim Norm\left(\mu,\frac{\sigma}{\sqrt{t}}\right)$	$E\left[\frac{EPS_t - EPS_{t-1}}{\lvert EPS_{t-1}\rvert}\right]$	$\sqrt{Var\left[\frac{EPS_t - EPS_{t-1}}{\lvert EPS_{t-1}\rvert}\right]}$
[3.5] **Return** R_t $R_t \in (-\infty,\infty)$	$R_T \sim Norm(\mu,\sigma)$ Average over t years: $E[R] \sim Norm(\mu,\sigma/\sqrt{t})$	$E[R_t]$	$\sqrt{Var[R_t]}$
[3.6] **Absolute** $ABS_t \in (0,\infty)$	$ABS_t = e^Y$ $Y \sim Norm\left(\ln(ABS_0)+\left(\mu-\frac{1}{2}\sigma^2\right)T,\sigma\sqrt{t}\right)$	$\ln\left(E\left[\frac{ABS_t}{ABS_{t-1}}\right]\right)$	$\sqrt{Var\left[\ln\left(\frac{ABS_t}{ABS_{t-1}}\right)\right]}$
[3.7] **Other**	*LTI* ~ *Uni*(min, max)	$\frac{(\min+\max)}{2}$	$\frac{(\max-\min)}{\sqrt{12}}$

Again, the objective is to execute robust calculations. Therefore, a short- and longer-time period will be used to predict the average and standard deviations for the simulations. Share price data is available for each trading day. To avoid serial correlation, weekly data is used. The short time period equals 1 year (‘alternative A’) and the long period the average of 1, 3, 5 and 10 years (‘alternative B’). For internal measures, accounting data is used. These are only available once per year. In order to have a meaningful number of input factors a 4-year period is used for the short term scenario, alternative A (in line with best practice provision II.1.1 of the Dutch Corporate Governance Code regarding the term in office). The longer-term scenario, alternative B, is in line with the period used for share price-related conditions, i.e. based on the average of 3, 5 and 10 years.

The correlation between the underlying vehicle and the performance measure is taken into account at the level of the underlying normal distribution (i.e. $\ln(S_t/S_{t-1})$ for share prices; EPS_t/EPS_{t-1} for EPS; R_t for return and $\ln(ABS_t/ABS_{t-1})$ for absolute measures). Accounting data are available on a yearly basis. Therefore, share prices are matched on a yearly basis. In order to establish robust yearly share prices, the average share price is taken around the end of the year. S_t = average share price over the period of 2 weeks at the end of year t and 2 weeks at the start of year t+1. S_{t-1} = average share price over the period of 2 weeks at the end of year t-1 and 2 weeks at the start of year t.

From data collection to calculation of the CompRisk$_{LTI}$ index – step by step

Below, as an illustrative example, I will show the work flow from collection of the data, to establishing the CompRisk$_{LTI}$ index in 5 steps:

1) Collection of plan details: The long-term incentive information is obtained through annual report research. The needed information is the vehicle (cash, shares or options), the performance measure, the vesting period, the vesting schedule, and in case of relative measurement the comparator companies. I will assume a ‘company A’ with a share plan which vests after 3 years based on the achievement of total shareholder return relative to a group of 9 industry peers (company B until J). There will be no vesting of shares if company A reaches the last position in the peer group. If the first position is achieved 200% of the conditionally granted shares will vest.

Table 3.10: Vesting schedule of company A

Position in the peer group at t=3	Vesting as a % of initial grant
1	200%
2	175%
3	150%
4	125%
5	100%
6	100%
7	75%
8	50%
9	25%
10	0%

2) Calculation of vehicle parameters as input for the simulation: The payment vehicle is a share. Therefore, I will follow equation 3.2 to simulate future share price paths. The share at t= 0 is the starting point; S_0 = 10. As input for the simulation the risk free rate (r) is established, based on same currency zero coupon government bonds, with an equal maturity until the vesting period, i.e. 3 years. For this example, I will assume r = 4%. Volatility (σ) and dividend yield (δ) of the company are calculated based on historical share data. As aforementioned, for the sake of robustness, I will run every simulation twice, based on two different historical periods to determine input data; a) the 1 year preceding the grant; b) an average of input data calculated for the 1, 3, 5 and 10 year period preceding the grant. In this example, I will only focus on the first alternative. The period of 1 year is used to establish the paid out dividend as a percentage of the underlying share price. For this example, I will assume a company with no dividend yield; δ = 0%. Based on weekly share price data the volatility is established, which is the standard deviation of the return provided by the stock in one year when the return is expressed using continuous compounding; σ = 30%.

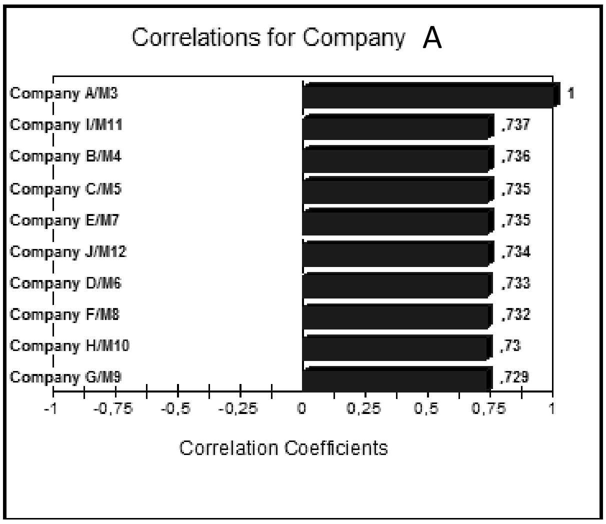
3) Calculation of performance measure parameters as input for the simulation: The measure of performance is total shareholder return, relative to a group of industry peers. Therefore, also for the simulation of the performance condition, I rely on equation 3.2. For this purpose the dividend yield is calculated (assume here 0%), share price volatility (assume a range between 10% and 100%) for each of the 9 other companies (B to J), as well as the correlation coefficients between the companies. In the simulation program @Risk, the correlation coefficients are linked to equation 3.2, through a correlation matrix.[163] I will assume here a correlation of 0.75 between the companies A till J. The reported correlations from the @Risk program after simulation are reflected in figure 3.3.

---

[163] This footnote provides information on the procedure that @Risk follows in correlating output. It is based on the rank order correlation coefficient as developed by C. Spearman in the early 1900's. It is calculated using rankings of values, not actual values themselves (as is the linear correlation coefficient). A value's "rank" is determined by its position within the min-max range of possible values for the variable. @RISK generates rank-correlated pairs of sampled values in a two-step process: (i) A set of randomly distributed "rank scores" is generated for each variable. If 100 iterations are to be run, for example, 100 scores are generated for each variable. Rank scores are simply values of varying magnitude between a minimum and maximum. @RISK uses van der Waerden scores based on the inverse function of the normal distribution. These rank scores are then rearranged to give pairs of scores which generate the desired rank correlation coefficient. For each iteration there is a pair of scores, with one score for each variable. (ii) A set of random numbers (between 0 and 1) to be used in sampling is generated for each variable. Again, if 100 iterations are to be run, 100 random numbers are generated for each variable. These random numbers are then ranked smallest to largest. For each variable, the smallest random number is then used in the iteration with the smallest rank score, the second smallest random number is used in the iteration with the second smallest rank score, and so on. This ordering based on ranking continues for all random numbers, up to the point where the largest random number is used in the iteration with the largest rank score. In @RISK, this process of rearranging random numbers happens prior to simulation. It results in a set of paired random numbers that can be used in sampling values from the correlated distributions during an iteration of the simulation. This method of correlation is known as a "distribution-free" approach because any distribution types may be correlated. Although the samples drawn for the two distributions are correlated, the integrity of the original distributions is maintained. The resulting samples for each distribution reflect the distribution function from which they were drawn.

Figure 3.3: Reported correlation coefficients by @Risk (screen print)

The screen print below shows the correlation coefficients as reported by the simulation program @Risk, between company A and the other companies. The output values are close to the input value of 0.75 for each company. Minor differences are based on the Monte Carlo sampling technique and the way correlations are taken into account (see footnote on the previous page).

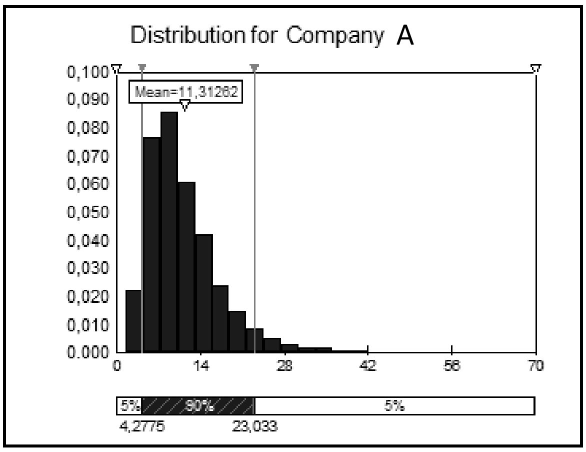


4) Simulation: the simulation creates 10,000 states of the world for Company A, as well as its peers B to J. An example of summary statistics for Company A is shown in figure 3.4.

Figure 3.4: Reported summary statistics by @Risk (screen print)

The screen print below shows summary statistics as reported by the simulation program @Risk.

Summary Statistics			
Statistic	**Value**	**%tile**	**Value**
Minimum	1,634059191	5%	4,277481556
Maximum	64,84980774	10%	5,086484432
Mean	11,31262402	15%	5,801242828
Std Dev	6,255058473	20%	6,441934109
Variance	39,1257565	25%	7,039144039
Skewness	1,785468178	30%	7,56442976
Kurtosis	8,483121783	35%	8,12199688
Median	9,845453262	40%	8,661812782
Mode	8,294364929	45%	9,218281746
Left X	4,277481556	50%	9,845453262
Left P	5%	55%	10,54853821
Right X	23,03297424	60%	11,26042175
Right P	95%	65%	12,07635307
Diff X	18,75549269	70%	13,04786968
Diff P	90%	75%	14,04928303
#Errors	0	80%	15,28295898
Filter Min		85%	16,75198174
Filter Max		90%	19,08836937
#Filtered	0	95%	23,03297424



5) *Calculation of CompRisk*: For each state of the world, the relevant payment is calculated by combining the value of the underlying vehicle (step 3) with the associated vesting result (table 3.10) based on the performance simulation (step 4). Discounting all the payments to t = 0 and calculating the mean and standard deviation, results in an average value of 12.90 per performance share and a standard deviation of the value of 8.32. The CompRisk index is therefore (8.32/12.90) * 100 = 64.50.

3.2.3 Total Direct Compensation (TDC)

The CompRisk index at the total direct compensation level reflects the total risk stemming from the combination of fixed compensation (basic salary) and variable compensation (short-term and long-term incentives).

Assume:

- B = basic salary (security)
- S = short-term variable pay
- L = long-term variable pay
- TDC = Total Direct Compensation = B + S + L

$$CompRisk_{TDC} = \frac{\sigma_{TDC}}{\mu_{TDC}} * 100 \quad \textbf{[3.8a]}$$

Where:

- σ = standard deviation
- μ = average

I will first break down the nominator (for now based on the square of the standard deviation, i.e. the variance):

$$\sigma_{TDC}^2 = E\left[(TDC - \mu_{TDC})^2\right] = E\left[(S-\mu_S)^2 + (L-\mu_L)^2 + 2(S-\mu_S)(L-\mu_L)\right] = \sigma_S^2 + \sigma_L^2 + 2\sigma_{SL}$$

To simplify the interpretation, the covariance is rewritten in terms of the correlation coefficient between S and L. The average value of TDC is shown as well:

$$\sigma_{TDC}^2 = \sigma_S^2 + \sigma_L^2 + 2\rho_{SL}\sigma_S\sigma_L$$

$\mu_{TDC} = B + \mu_S + \mu_L$

Where: ρ = correlation coefficient between S (short-term incentive) and L (long-term incentive payout).

Besides equation 3.8a, the CompRisk index therefore also depends on equation 3.8b:

$$CompRisk_{TDC} = \frac{\sqrt{\sigma_S^2 + \sigma_L^2 + 2\rho_{SL}\sigma_S\sigma_L}}{B + \mu_S + \mu_L} * 100$$

[3.8b]

As a final alternative, I rewrite the index in terms of the STI and LTI only, where security is taken into account to establish the weights within the total direct compensation package.

$$CompRisk_{TDC} = \frac{\sqrt{\sigma_S^2 + \sigma_L^2 + 2\rho_{SL}\sigma_S\sigma_L}}{B + \mu_S + \mu_L} * 100$$

$$= \sqrt{\left(\frac{\sigma_S}{TDC}\right)^2 + \left(\frac{\sigma_L}{TDC}\right)^2 + 2\rho_{SL}\frac{\sigma_S}{TDC}\frac{\sigma_L}{TDC}} * 100$$

$$= \sqrt{\left(\frac{\mu_S CR(S)}{TDC}\right)^2 + \left(\frac{\mu_L CR(L)}{TDC}\right)^2 + 2\rho_{SL}\frac{\mu_S CR(S)}{TDC}\frac{\mu_L CR(L)}{TDC}}$$

$$= \sqrt{\left(w_S CR(S)\right)^2 + \left(w_L CR(L)\right)^2 + 2\rho_{SL} w_s w_L CR(S) CR(L)}$$

[3.8c]

Where: w_S and w_L equal the weight of the STI and the LTI respectively, in the total direct compensation package (i.e. the sum of base salary, target STI and fair value of the LTI). The CR equation shows that variable pay components can theoretically be used as a hedge within the compensation package. A negative payout correlation between S and L reduces the overall variability of the package and consequently the CR index. Furthermore, as base salary is a constant factor, it reduces the variability when the ratio of fixed versus variable pay is higher. We test the equations 3.8a to 3.8c in a simplified example. Table 3.11 transforms the lottery example of table 3.2 into a TDC example.

Table 3.11 CompRisk calculation based on a simplified simulation

Remuneration figures in 1,000. Applying the 3 different TDC CompRisk equations [3.8a, b, c] for the base case, results in the same answer of 57:

i) *Equation 3.8a*: (678/1200)*100 = 57;

ii) *Equation 3.8b* (correlation coefficient is determined based on the reflected values for the base case and equals 0.91287): (sqrt(60000 + 200000 + 2*0.91287*245*447)/(400+400+400))*100 = 57;

iii) *Equation 3.8c*:(sqrt(((400/1200)*61))^2+((400/1200)*112)^2+ 2*(400/1200)*(400/1200)*0.91287*61*112)) = 57

Base case	B	STI	LTI	TDC
1	400	800	1200	2400
2	400	700	1000	2100
3	400	600	800	1800
4	400	500	600	1500
5	400	400	400	1200
6	400	400	0	800
7	400	300	0	700
8	400	200	0	600
9	400	100	0	500
10	400	0	0	400
μ	400	400	400	1200
σ²	0	60000	200000	460000
σ	0	245	447	678
CompRisk	0	61	112	57

Alternative 1	B	STI	LTI	TDC
1	800	400	600	1800
2	800	350	500	1650
3	800	300	400	1500
4	800	250	300	1350
5	800	200	200	1200
6	800	200	0	1000
7	800	150	0	950
8	800	100	0	900
9	800	50	0	850
10	800	0	0	800
μ	800	200	200	1200
σ²	0	15000	50000	115000
σ	0	122	224	339
CompRisk	0	61	112	28

Alternative 2	B	STI	LTI	TDC
1	400	1600		2000
2	400	1400		1800
3	400	1200		1600
4	400	1000		1400
5	400	800		1200
6	400	800		1200
7	400	600		1000
8	400	400		800
9	400	200		600
10	400	0		400
μ	400	800		1200
σ²	0	240000		240000
σ	0	490		490
CompRisk	0	61		41

Alternative 3	B	STI	LTI	TDC
1	400		2400	2800
2	400		2000	2400
3	400		1600	2000
4	400		1200	1600
5	400		800	1200
6	400		0	400
7	400		0	400
8	400		0	400
9	400		0	400
10	400		0	400
μ	400		800	1200
σ²	0		800000	800000
σ	0		894	894
CompRisk	0		112	75

Table 3.11 shows that in the base case, the CEO earns a base salary of 400,000 and an equal expected short-term incentive (STI) and long-term incentive (LTI) payout. Total direct compensation (TDC) equals 1.2 million. This is an equal situation for the base case and the 3 presented alternatives. The LTI is more at risk than the STI; CR of 112 versus 61 respectively. The TDC CompRisk equals 57. Alternative 1 shows that if base salary were twice as high and variable compensation twice as low this would not change the CR of the STI and LTI, but would lower the TDC CompRisk from 57 to 28. Alternative 2 and 3 show the outcome for the case of no LTI and no STI, respectively. CompRisk of TDC equals 41 and 75, respectively. In alternative 3, the CEO is exposed to the greatest risk but also has the opportunity to earn 2.8 mln. In the remainder of this chapter, I will use equation 3.8c to determine the CompRisk of TDC, and as a starting point the standard assumption of zero correlation between STI and LTI.

3.3. Descriptive statistics – level of risk in compensation contracts (NL and UK)

In order to determine the compensation risk of real life contracts, a dataset was developed based on Dutch and UK companies. The time period equals 2001-2008. Because extensive contract information is needed, I have focused on the largest listed companies in each of these jurisdictions. Large listed companies are more transparent about their pay practices than smaller and/or non-listed companies. The FTSE 100 index in the UK, and the AEX (large cap), AMX (mid cap) and AscX (small cap) indices in the Netherlands are used. The criterion for inclusion in the dataset was that the company is listed in 2008 as well as in the prior four-year period. This results in a group of 161 companies. Of these companies, 4 have a dual listing (i.e. listed both in the Netherlands as well as the UK); of the remaining companies 62 have a Dutch listing and 95 a UK listing. The total number of firm-years equals 1,216. Table 3.12 provides an overview of the companies in the sample per year, table 3.13 the observations per industry,[164] and table 3.14 an overview of the scope figures.

Table 3.12: Number of companies per year

Year	Number of companies
2001	105
2002	146
2003	160
2004	161
2005	161
2006	161
2007	161
2008	161
Total	1,216

Table 3.13: Number of observations per industry

Industry number	Industry name	Number of obs.	Number of obs (%)
0001	Oil & gas	53	4%
1000	Basic materials	78	6%
2000	Industrials	265	22%
3000	Consumer goods	141	12%
4000	Health care	46	4%
5000	Consumer services	191	16%
6000	Telecommunications	32	3%
7000	Utilities	39	3%
8000	Financials	291	24%
9000	Technology	80	7%
		1216	100%

[164] Industries based on the Industry Classification Benchmark (ICB), offered by FTSE and Dow Jones.

Table 3.14: Scope figures

This table shows the scope figures of the companies in the data sample. 'N' refers to the number of observations in the UK, NL and total sample. Because 4 companies (Logica, Reed Elsevier, Royal Dutch, Unilever) have both a Dutch and a UK listing, the number of observations in the total sample equals 1,216 instead of 1,247 (768+479).

Sample	Statistics	Revenue (€ mln)	Total assets (€ mln)	Market capitalisation (€ mln)	Employees
UK	25th percentile	1,483	2,839	2,462	5,603
	50th percentile	4,671	9,177	5,611	21,600
	75th percentile	14,375	30,529	14,563	54,393
	N	768	768	768	768
NL	25th percentile	312	491	286	1,772
	50th percentile	1,270	1,434	857	5,640
	75th percentile	4,023	6,728	3,833	21,662
	N	479	479	479	479
Total sample	25th percentile	797	1258	1,020	2,938
	50th percentile	2,948	4,476	3,329	10,864
	75th percentile	11,090	18,643	10,357	39,437
	N	1,216	1,216	1,216	1,216

The UK companies differ from the Dutch companies, e.g. in terms of size (the UK companies are larger), board structure (UK companies have a one-tier board and Dutch companies typically have a two-tier board), etc. In the regressions this is taken into account by incorporating variables to control for size, governance, and other relevant factors.

In the following subsections, the results of the CompRisk index calculations are provided for the companies in the dataset. A distinction is made between the short-term incentive (STI), the long-term incentive (LTI) and total direct compensation (TDC).

3.3.1 Short-term incentive

For the short-term incentive, I have calculated the CompRisk index based on 3, 4 and 5 year historical data, in line with the calculation methodology as described in section 3.2. Within the research period (2001-2008), there are fewer results if the historical period used to calculate the CRI is longer. Refer to table 3.15 and graph 3.1 for an overview of the calculation results.

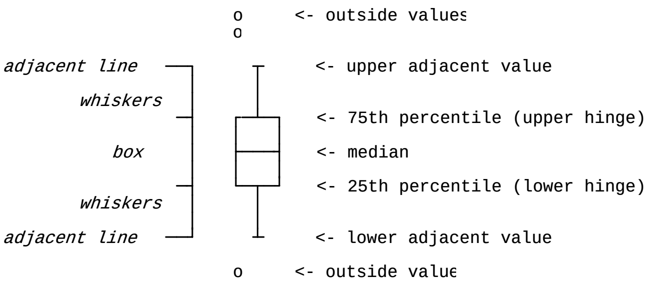
Table 3.15: Total sample table CompRisk index STI for 3, 4 and 5 year historical period

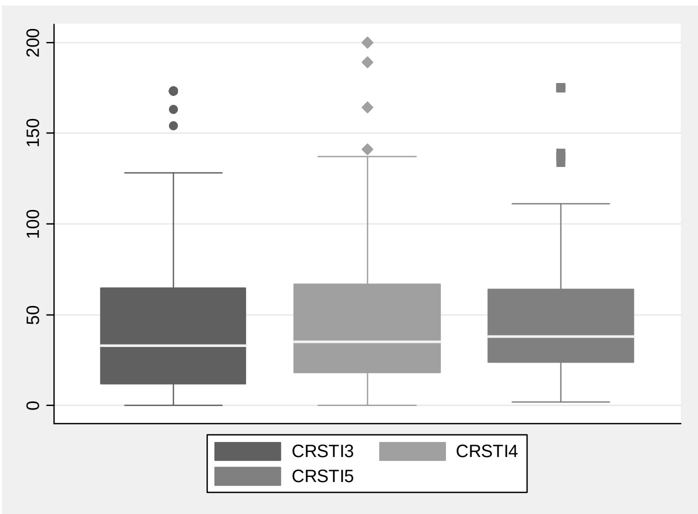
This table shows the CompRisk index for the short-term incentive plan. The index is calculated based on 3, 4, and 5 year data (CR STI3, CR STI4, CR STI5 respectively) as described in section 3.2.2.1. As an example: ‘CR STI 3’ stands for the CompRisk calculated for the short-term incentive remuneration element, based on 3 year historical data.

Statistics	CR STI 3	CR STI 4	CR STI 5
25th percentile	12	18	24
50th percentile	33	35	38
Mean	45	46	48
75th percentile	65	67	63
N	735	575	414

Graph 3.1: Total sample graph CompRisk index STI for 3, 4 and 5 year historical period

This graph shows vertical box plots of the CompRisk index for the short-term incentive (STI) remuneration element, based on 3, 4, and 5 year historical data. In this vertical box plot, the y-axis is numerical (here: CompRisk figures), and the x-axis is categorical (here: the selected time period of 3, 4 and 5 year history). Reading of the graph box is facilitated by the explanation below. The upper and lower adjacent values are calculated based on Tukey (1977), at 1.5 times the interquartile range. Values outside this cluster, are labelled ‘outside values’ and plotted separately. For a guide on content see table 3.15.





The average compensation risk based on a 4-year historical period equals 46. The typical range (25th to 75th percentile) is between 18 and 67. The differences between the UK and the Netherlands are reflected in table 3.16.

Table 3.16: NL versus UK comparison of CompRisk index figures STI

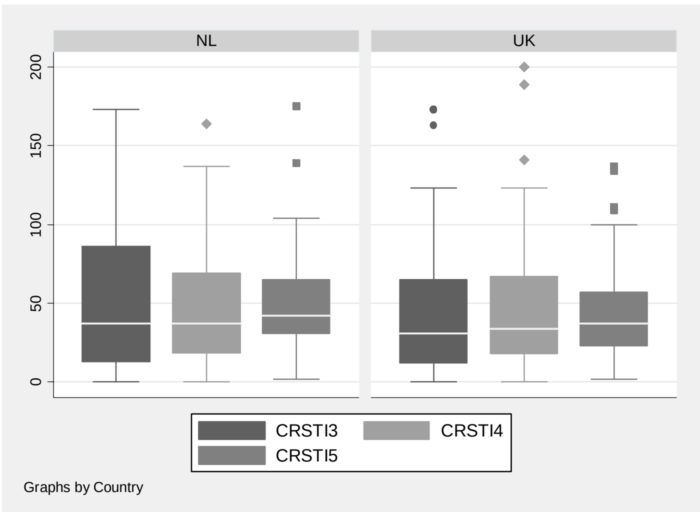
This table shows a comparison of the NL and UK CompRisk index for the short-term incentive plan.[165] The index is calculated based on 3, 4, and 5 year data, as described in section 3.2.2.1. As an example: 'CR STI 3' stands for the CompRisk calculated for the short-term incentive remuneration element, based on 3 year historical data.

Statistics	CR STI 3		CR STI 4		CR STI 5	
	NL	UK	NL	UK	NL	UK
25th percentile	13	12	18	18	31	23
50th percentile	37	31	37	34	42	37
Mean	46	45	46	47	50	47
75th percentile	86	65	69	67	65	57
N	273	482	208	383	142	284

The comparison in table 3.16 shows that differences between the UK and NL are minor (especially for the 4-year calculation and somewhat more pronounced for the 3- and 5-year calculation). If this is the case, disparities in compensation risk are reflective of industry, company or individual differences and not related to the specific country. In terms of outliers we observe some differences as reflected in graph 3.2.

Graph 3.2: NL versus UK comparison CompRisk STI

This graph shows vertical box plots, for the Dutch (NL) and UK sample, of the CompRisk index for the short-term incentive (STI). For a guide on content see table 3.16. See graph 3.1 for a guide on how to read the box plot.



[165] The N (count of observations) of NL and UK does not equal the total count given the fact that Logica CMG, Reed Elsevier, Royal Dutch Shell and Unilever are part of both data cuts but only once part of the total data sample.

3.3.2 Long-term incentive

For the long-term incentive, the CompRisk index is calculated based on the relevant contract details for the specific grant. As input for the valuation, I rely on 1-year historical data (alternative A). As a robustness check, I have also run the valuations by taking into account a longer historical period that is weighted towards the present by taking the average of 1, 3, 5 and 10 years (alternative B). In line with the calculation methodology as described in section 3.2, descriptive statistics are presented for the simulation outcomes for the research period (2001-2008). Whether or not the CEO is exposed to risk stemming from the LTI starts with the question of whether or not the CEO receives an LTI grant. The prevalence of these grants is reflected in table 3.17.

Table 3.17: Prevalence of LTI grant in the research period (based on firm-years)

This table shows, for the total sample, in how many firm-years there was an LTI grant for the CEO. The table also shows a comparison between the Dutch and UK sample.

	Total sample		NL		UK	
	#	%	#	%	#	%
LTI	1034	85	356	74	709	92
No LTI	182	15	123	26	59	8
N	1216		479		768	

In the total sample, in 85% of the firm-years an LTI grant was made to the CEO. In the remainder of this section, I will focus on these 1,034 LTI observations. LTI grants are more prevalent in the UK than in the Netherlands (92% versus 74% of firm-years). For the country samples, I focus on the 356 Dutch LTI observations and 709 UK observations.[166] CompRisk index figures for the LTI component are presented in table 3.18 and graph 3.3 for the total sample and in table 3.19 and graph 3.4 for the country samples.

Table 3.18: Total sample of CompRisk index LTI for alternative A and B

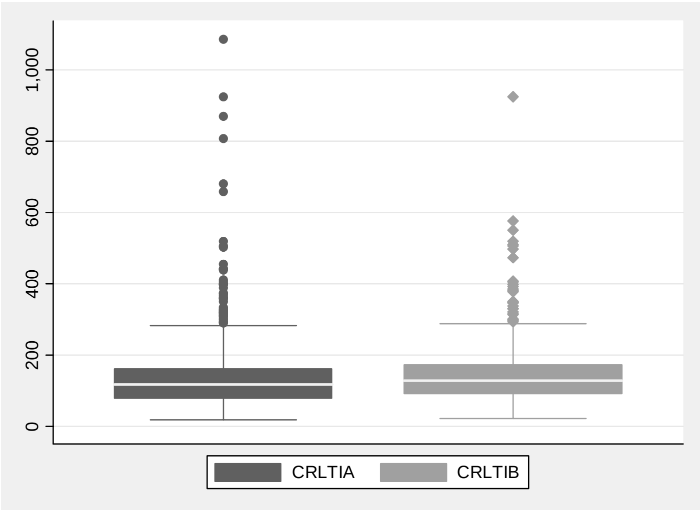
This table shows the CompRisk index for the long-term incentive (LTI) plan. The CompRisk index is calculated based on the contractual LTI in place in the research year. Determining the expected payout and variation around the average is based on simulation. Input for the simulation, such as company volatility, is based on two alternative historical periods, as described in section 3.2.2.2. The shorter time period is referred to as 'A' and the longer time period is referred to as 'B'. Example: 'CR LTI A' stands for the CompRisk, calculated for the long-term incentive, based on historical data under alternative A.

[166] As mentioned above, Logica CMG, Reed Elsevier, Royal Dutch and Unilever are counted once for the full sample. However, in the separate samples, these companies are used in both subsamples. This implies that the sum of the UK and NL observations overstates the number of observations in the total sample (by 31 observations).

Statistics	CR LTI A	CR LTI B
25th percentile	80	93
50th percentile	118	128
Mean	135	140
75th percentile	162	173
N	1034	1034

Graph 3.3: Sample box plot of CompRisk index LTI for alternative A and B

This graph shows vertical box plots, for the Dutch (NL) and UK sample of the long-term incentive (LTI). See table 3.18 for a guide on the content. See graph 3.1 for a guide on how to read the box plot.



The average compensation risk based on alternative A equals 135. The typical range is between 80 and 162. This implies that LTIs are by nature riskier than STIs. The differences between the Netherlands and the UK are reflected in table 3.19 and graph 3.4.

Table 3.19: NL versus UK comparison of CompRisk index figures LTI

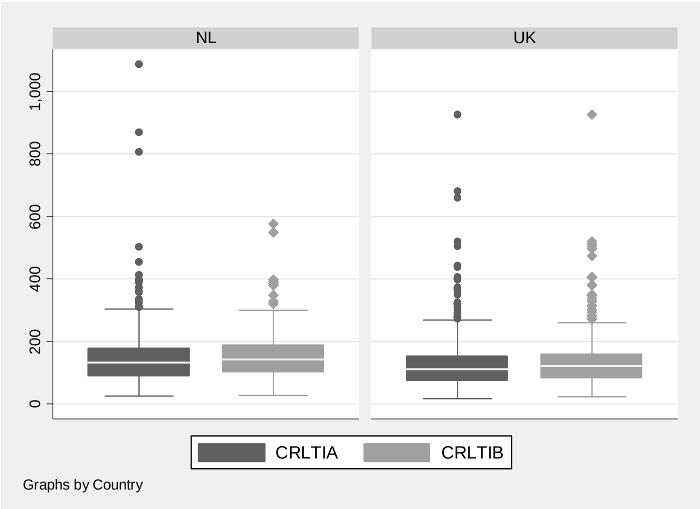
This table shows a comparison of the NL and UK CompRisk index for the long-term incentive plan. The CompRisk index is calculated based on the contractual LTI in place in the research year. Determining the expected payout and variation around the average is based on simulation. Input for the simulation, such as company volatility, is based on two alternative historical periods, as described in section 3.2.2.2. The shorter time period is referred to as 'A' and the longer time period is referred to as 'B'. As an example: 'CR LTI A' stands for the CompRisk, calculated for the long-term incentive remuneration element, based on historical input data under alternative A.

Statistics	CR LTI A		CR LTI B	
	NL	UK	NL	UK
25th percentile	90	75	104	85
50th percentile	133	111	143	122

Statistics	CR LTI A		CR LTI B	
	NL	UK	NL	UK
Mean	149	126	153	133
75th percentile	177	154	189	159
N	356	709	356	709

Graph 3.4: NL versus UK comparison of CompRisk LTI

This graph shows vertical box plots, for the Dutch (NL) and UK sample of the CompRisk index for the long-term incentive (LTI). See table 3.19 for a guide on the content. See graph 3.1 for a guide on how to read the box plot.



Differences are observed between the Netherlands and the UK. Long-term incentives in the Netherlands are riskier than in the UK, given the higher $\text{CompRisk}_{\text{LTI}}$ figures.

3.3.3 Total Direct Compensation

At the total direct compensation level variable pay (STI and LTI) is combined with fixed compensation, in order to establish the total risk associated with the direct compensation elements. Table 3.20 provides an overview of the sample. We present the results of 6 analyses. The first 3 reflect alternative A for the long-term incentive and for the STI 3-, 4- and 5-year historical data. The second three results reflect alternative B for the LTI and the same scenarios for the STI as described under A. It is assumed that there is no correlation between the STI and LTI payouts. This assumption is based on the different timing of payouts (STI after 1 year and LTI typically after 3 years) and the different ways that STI and LTI performance is measured (accounting versus market-based performance). It is furthermore in line with academic studies that have found no or little direct correlation between cash bonus payouts and share price movements. For the sake of completeness, we also show the extreme scenarios of absolute positive and negative correlation in appendix 3.2 ($\rho = 1$ and -1 respectively).

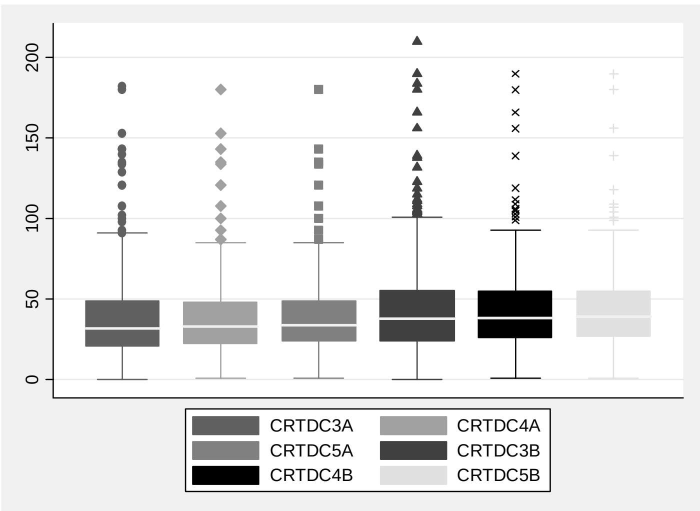
Table 3.20: Total sample table of CompRisk index TDC (ρ = 0)

This table shows the CompRisk index for total direct compensation (TDC). TDC is the sum of basic salary, the expected value of the short-term incentive (STI) plan and the expected value of the long-term incentive (LTI) plan. In terms of the STI, the index is calculated based on 3, 4, and 5 year data, as described in section 3.2.2.1. In terms of the LTI, the CompRisk index is calculated based on the contractual LTI in place in the research year. Determining the expected payout and variation around the average is based on simulation. Input for the simulation, such as company volatility, is based on two alternative historical periods, as described in section 3.2.2.2. The shorter time period is referred to as 'A' and the longer time period is referred to as 'B'. As an example: 'CR TDC 3 A' stands for the CompRisk, calculated for total direct compensation, based on 3 year historical data for the STI and based on historical input data under alternative A for the LTI. The assumed correlation coefficient (ρ) between the STI and the LTI equals zero.

Statistics	CR TDC 3 A	CR TDC 4 A	CR TDC 5 A	CR TDC 3 B	CR TDC 4 B	CR TDC 5 B
25th percentile	21	22	24	24	26	27
50th percentile	32	33	34	38	39	39
Mean	37	37	38	42	42	43
75th percentile	49	48	49	56	55	55
N	735	575	414	735	575	414

Graph 3.5 Sample box plot of CompRisk index TDC (ρ = 0)

This graph shows the CompRisk index for total direct compensation (TDC). See table 3.20 for a guide on the content. See graph 3.1 for a guide on how to read the box plot.



The results are quite similar, especially within alternative A and B (LTI). The amount of fixed compensation together with the weight and structure of the LTI are dominant factors in the compensation risk of the total package. Since this is the case, the analysis is extended to include the uniform distribution for the STI. This provides an overview of the total sample of 1,216 firm-year observations.

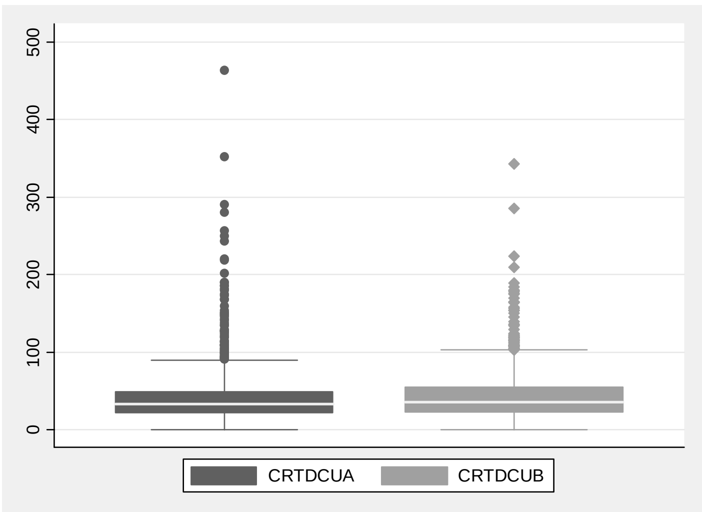
Table 3.21: Total sample table of CompRisk index TDC (STI = uniform, ρ = 0)

This table shows the CompRisk index for total direct compensation (TDC). TDC is the sum of basic salary, the expected value of the short-term incentive (STI) plan and the expected value of the long-term incentive (LTI) plan. In terms of the STI, the index is calculated based on the uniform distribution. In terms of the LTI, the CompRisk index is calculated based on the contractual LTI in place in the research year. Determining the expected payout and variation around the average is based on simulation. Input for the simulation, such as company volatility, is based on two alternative historical periods, as described in section 3.2.2.2. The shorter time period is referred to as 'A' and the longer time period is referred to as 'B'. As an example: 'CR TDC U A' stands for the CompRisk, calculated for total direct compensation, based on the uniform distribution for the STI and based on historical input data under alternative A for the LTI. The assumed correlation coefficient (ρ) between the STI and the LTI equals zero.

Statistics	CR TDC U A	CR TDC U B
25th percentile	22	23
50th percentile	33	36
Mean	42	43
75th percentile	49	55
N	1,216	1,216

Graph 3.6: Total sample graph of CompRisk index TDC (STI = uniform, ρ = 0)

This graph shows the CompRisk index for total direct compensation (TDC). See table 3.21 for a guide on the content. See graph 3.1 for a guide on how to read the box plot.



For the CompRisk$_{TDC}$ index based on a uniformly distributed STI, a similar pattern is observed as in the analyses for 3, 4 and 5 years, but it is also established that the full dataset is tainted by a few outliers. These outliers have to be dealt with, in the regression analyses of sections 4.4 and 4.5.

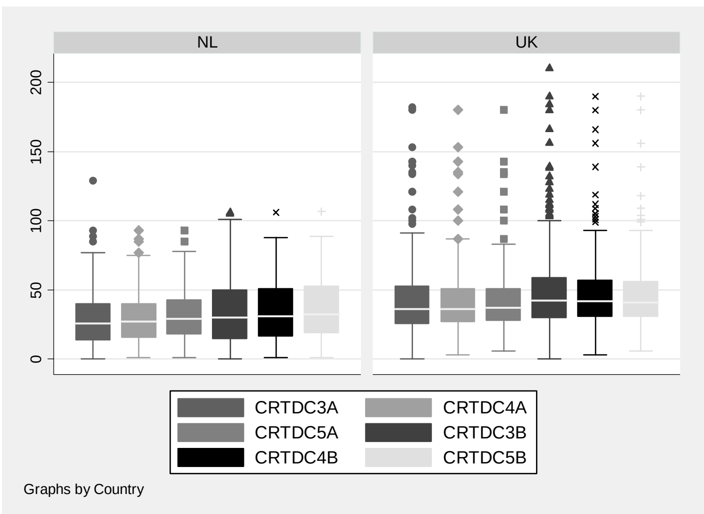
Table 3.22: NL versus UK comparison of CompRisk index figures TDC (ρ = 0)

This table shows a comparison for the NL and UK sample of the CompRisk index for total direct compensation (TDC). TDC is the sum of basic salary, the expected value of the short-term incentive (STI) plan and the expected value of the long-term incentive (LTI) plan. In terms of the STI, the index is calculated based on 3, 4, and 5 year data, as described in section 3.2.2.1. In terms of the LTI, the CompRisk index is calculated based on the contractual LTI in place in the research year. Determining the expected payout and variation around the average is based on simulation. Input for the simulation, such as company volatility, is based on two alternative historical periods, as described in section 3.2.2.2. The shorter time period is referred to as 'A' and the longer time period is referred to as 'B'. As an example: 'CR TDC 3 A' stands for the CompRisk, calculated for total direct compensation, based on 3 year historical data for the STI and based on historical input data under alternative A for the LTI. The assumed correlation coefficient (ρ) between the STI and the LTI equals zero.

Statistics	CRTDC3A		CRTDC4A		CRTDC5A		CRTDC3B		CRTDC4B		CRTDC5B	
	NL	UK	NL	UK	NL	UK	NL	UK	NL	UK	NL	UK
25th percentile	14	26	16	27	18	28	15	30	17	31	19	31
50th percentile	26	36	27	36	29	37	30	42	31	42	32	41
Mean	30	41	31	40	33	41	34	47	35	46	36	46
75th percentile	40	53	40	51	43	51	50	59	51	57	53	56
N	273	482	208	383	142	284	273	482	208	383	142	284

Graph 3.7: NL versus UK comparison of CompRisk TDC (ρ = 0)

This graph shows vertical box plots, for the Dutch (NL) and UK sample of the CompRisk index for total direct compensation (TDC). See table 3.22 for a guide on the content. See graph 3.1 for a guide on how to read the box plot.



The analysis is extended to include the uniform distribution for the STI. This gives an overview of the total sample of firm-year observations.

Table 3.23: NL versus UK comparison table of CompRisk index TDC (STI=uniform, ρ=0)

This table shows a comparison for the NL and UK sample of the CompRisk index for total direct compensation (TDC). TDC is the sum of basic salary, the expected value of the short-term incentive (STI) plan and the expected value of the long-term incentive (LTI) plan. In terms of the STI, the index is calculated based on the uniform distribution. In terms of the LTI, the CompRisk index is calculated based on the contractual LTI in place in the research year. Determining the expected payout and variation around the average is based on simulation. Input for the simulation, such as company volatility, is based on two alternative historical periods, as described in section 3.2.2.2. The shorter time period is referred to as 'A' and the longer time period is referred to as 'B'. As an example: 'CR TDC U A' stands for the CompRisk, calculated for total direct compensation, based on the uniform distribution for the STI and based on historical input data under alternative A for the LTI. The assumed correlation coefficient (ρ) between the STI and the LTI equals zero.

Statistics	CR TDC U A		CR TDC U B	
	NL	UK	NL	UK
25th percentile	16	27	17	30
50th percentile	25	38	27	42
Mean	34	47	35	50
75th percentile	39	55	44	60
N	479	768	479	768

Graph 3.8: NL versus UK comparison graph of CompRisk index TDC (STI=uniform, ρ=0)

This graph shows vertical box plots, for the Dutch (NL) and UK sample of total direct compensation (TDC). See table 3.23 for a guide on the content. See graph 3.1 for a guide on how to read the box plot.

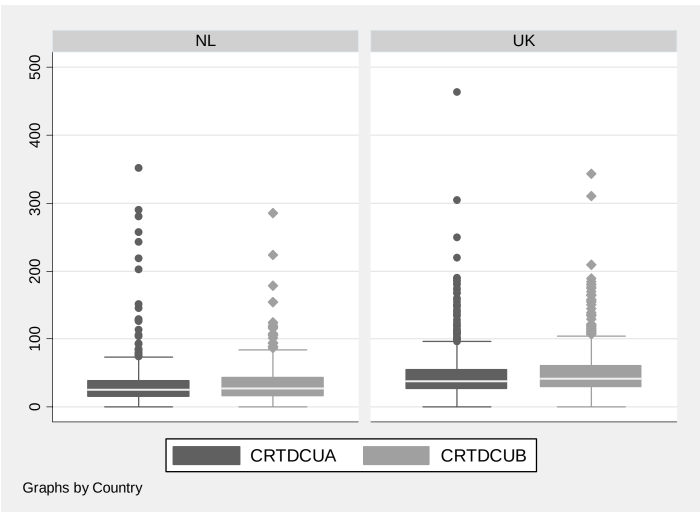


Table 3.22/3.23 and graph 3.7/3.8 show that compensation risk at the TDC level is more pronounced in the UK than in the Netherlands.

3.3.4. Summary

In section 3.3, the Dutch and UK markets were researched with respect to compensation risk related to the short-term incentive, long-term incentive and total direct compensation. Table 3.24 provides a summary and comparison. The results are significant, as shown in appendix 3.3.

Table 3.24: NL versus UK comparison of CompRisk

CompRisk	NL	UK
Short-term incentive	=	=
Long-term incentive	+	-
Total direct compensation	-	+

Table 3.24 shows that the STI CompRisk in the Netherlands is similar to the UK, and that the LTI CompRisk is higher in the Netherlands than in the UK. The sum leads to the CompRisk of total direct compensation. In order to interpret the CompRisk_{TDC} figures, additional information is needed. Table 3.25 shows the weight of variable pay as a percentage of total direct compensation.

Table 3.25: NL versus UK comparison of variable pay as % of total direct compensation

This table shows variable pay as a percentage of total direct compensation. Variable pay is defined as the sum of the target STI and the expected LTI value (under alternative A and B). Total direct compensation is defined as the sum of these variable remuneration elements plus fixed compensation.

Statistics	A		B	
	NL	UK	NL	UK
25th percentile	30	49	30	49
50th percentile	42	60	42	61
Mean	43	59	43	60
75th percentile	57	70	57	71
N	479	768	479	768

Table 3.24 and 3.25 show that comparing compensation elements in isolation can give a distortive view. Based on the sum of the risk of the separate STI and LTI, one would expect a higher compensation risk for total direct compensation in the Netherlands. However, as a result of more variable pay within the total compensation package, the UK has more pay-at-risk at the overall level.

3.4 Use of the CompRisk index

In this section, I discuss the use of the CompRisk index. I will focus on two aspects specifically:

1. The CompRisk matrix: This section adds a dimension to plain vanilla pay-level benchmarking. In practice, decisions on pay levels are often made in isolation. A benchmark is executed and based on this market reference, a decision is made whether the package qualifies as market competitive and should be adjusted or not. Pay structure (i.e. payment risk) is discussed separately. It could be advocated that pay levels should be assessed in conjunction with the associated risk. A CompRisk matrix, combining compensation level and risk, can provide such an overview and enhances the quality of decision making. An alternative way of benchmarking, based on the Sharpe ratio, is discussed as well;
2. Drivers of compensation risk: This section is intended to provide scholars and remuneration committees with a better understanding of the drivers of risk from a contract-design perspective.

3.4.1 The CompRisk matrix

In order to assess the market competitiveness of the CEO pay level, remuneration committees periodically execute a benchmark study. They collect remuneration figures (with or without the help of a pay consultant) based on a group of companies that are considered relevant from a labour market-competition perspective. The market results are ranked from the lowest- to the highest-paying company. Typical anchor points to establish the market competitive position of the CEO are the 25th percentile, the median and the 75th percentile. As mentioned above, pay decisions are often made in isolation. Situation below the market median is often a trigger to adjust pay levels upward. However, if the risk of this compensation is also below the median, this decision might not be optimal. A matrix in which both the expected value of the reward (ex-ante compensation) as well as the risk (potential ex-post payout variation) is reflected enhances decision making (see figure 3.5).

Figure 3.5: CompRisk matrix

This figure shows the CompRisk matrix. This matrix adds a dimension to traditional pay benchmarking. Typically, only the expected reward level (y-axis) is referenced against a group of peers. The additional risk classification, which can be based on the CompRisk index (x-axis), provides additional insight into the underlying structure of the remuneration package. The executive remuneration policy of a company can be classified in one of the reflected categories A till D.

	Below median	Risk	Above median
Above median	**A** "Free ride"		**B** "Situation with significant risk; strong corporate governance is needed"
Expected reward			
Below median	**C** "Low risk; attracts a risk averse individual"		**D** "Potential retention/ hiring issue"

This breaks down into the following categories:

- Section A: These compensation packages may not be easily defendable vis-à-vis stakeholders. The compensation level is situated at the top of the reference group, while the risk faced by the executive is situated at the bottom. Part of this category are packages that may be categorised in terms of a 'free ride' for the CEO (e.g. risk below the 25^{th} percentile and reward above the 75^{th} percentile);
- Section B: These compensation packages are characterised by very strong incentives. Such a situation can only be optimal when corporate governance is strong (i.e. adequate supervision). If the chance of detecting improper behaviour is small, this situation can result in an increase of agency costs (value destruction) instead of a decrease of agency costs (value creation);
- Section C: Without the combined risk versus reward approach, companies in section C will be inclined to adjust compensation levels upward. However, when the CompRisk index is added, one observes that the compensation risk is also positioned below the median. Therefore, the case for an adjustment in compensation levels will be significantly smaller;
- Section D: Problems can arise when hiring or retaining executives, especially if the compensation level is situated at the bottom of the reference group; meanwhile, the risk faced by the executive is situated at the top.

One can make more informed decisions based on the matrix. I offer a real-life case study to illustrate this point. One of the companies in the research sample is the company XYZ3. The 2008 annual report (page 40) assesses the labour-market peer group for the executive board.

'The peer group used to assess the competitiveness of the overall remuneration provided to the Corporate Executive Board is the same as that used to benchmark the performance of the Company. This peer group reflects company XYZ3's geographic operating areas and the markets most relevant in relation to the recruitment and retention of top management. In addition, peer group companies are selected based on relevant size, public listing and liquidity

of shares. The peer group: Company A, Company B, Company C, Company D, Company E, Company F, Company G, Company H, Company I, Company J, Company K'.

When executing a benchmark for the CEO position, this results in the following overview (ranking based on TDC level).

Table 3.26: Level benchmark for the CEO of Company XYZ3 – ranking based on TDC

Company	Level (basic pay)	Level (STI)	Level (LTI)	Level (TDC)
Company A	251706	95888	2856772	3204366
Company B	1000000	2272500	731185	4003685
Company C	900000	900000	3030264	4830264
Company D	1290300	1290300	3108100	5688700
Company E	836990	1255485	3876416	5968891
Company F	877375	1078740	4316805	6272921
Company G	1522747	2537912	2524598	6585258
Company H	967823	2419558	9175167	12562548
Company I	799706	997653	12368536	14165894
Company J	1047097	3350710	9854871	14252679
Company K	1042063	1042063	14088081	16172206
Company XYZ3	945000	945000	596901	2486901

Apart from the question of whether this peer group is indeed relevant for Company XYZ3 from a labour-market perspective, the results show that Company XYZ3 pays its CEO less than the other companies. In isolation this might result in upward pressure on CEO pay within Company XYZ3. As a second step, the associated compensation risk is calculated (see table 3.27).[167]

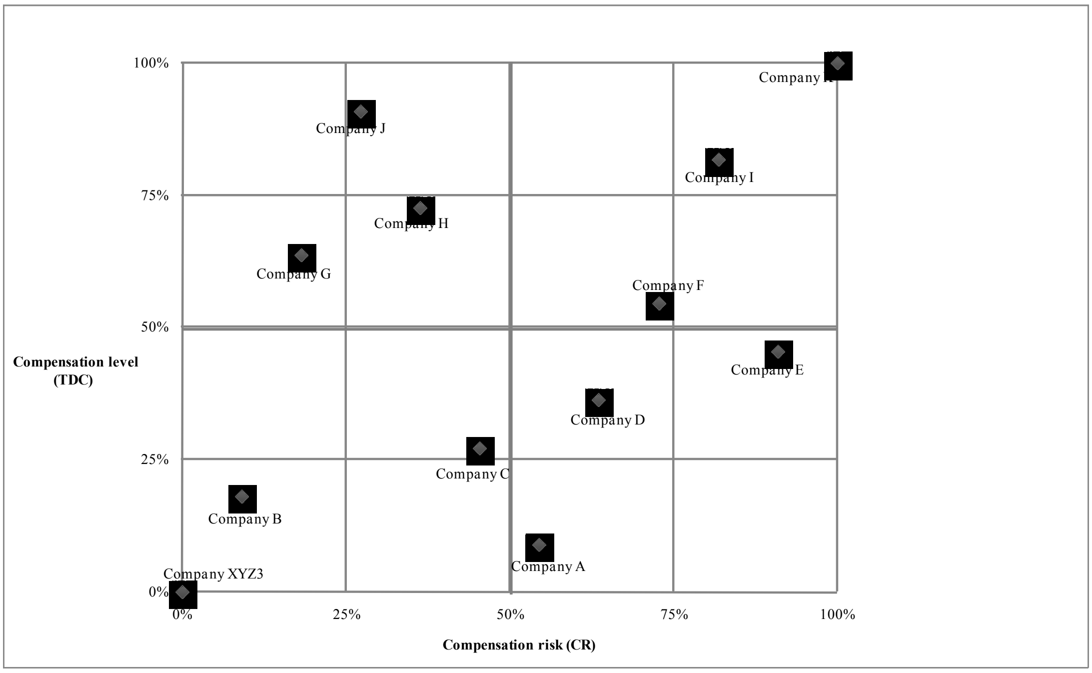
Table 3.27: Risk benchmark for CEO of Company XYZ3 – ranking based on TDC

Company	CompRisk (STI)	CompRisk (LTI)	CompRisk (TDC)
Company B	26	83	21
Company G	42	61	29
Company J	33	91	63
Company H	56	117	86
Company C	7	158	99
Company A	67	112	100
Company D	39	223	122
Company F	15	219	151
Company I	81	208	182
Company E	72	335	218
Company K	89	291	253
Company XYZ3	23	50	15

[167] The analysis is based on 4-year historical data for the STI and alternative A for the LTI (1-year historical share price data).

Table 3.26 shows that Company XYZ3 has the lowest proportion of variable pay (% of TDC). Pay is thus less 'at risk' within Company XYZ3. The STI and LTI structures further emphasise this notion (see table 3.27). In the matrix reflected in figure 3.6, the insights from steps 1 and 2 are combined. Compensation levels and risk are reflected by percentile ranking.

Figure 3.6: CompRisk matrix for Company XYZ3



On page 40 of the 2008 annual report, Company XYZ3 states that: 'The target Total Direct Compensation level is typically at the 50th percentile'. This implies that when establishing the total direct-compensation level, the anchor point chiefly used is the median of the reflected peer group. The matrix in figure 3.6 shows that Company XYZ3 is positioned at the bottom of the peer group in its compensation level. However this is also the case in terms of compensation risk. This would reduce the need for an adjustment of the pay levels.

Figure 3.6 is based on percentile ranking. This forces an equal amount of observations in each group. For a well defined peer group this is defendable. However it does not provide information on the incidence of a mismatch between risk and reward from a broader perspective, as defined by categories A and D in figure 3.5. To provide further insight, the 1,216 observations in the dataset, as described in the previous section, are used. To differentiate between lower income CEOs and higher income CEOs, 6 income categories are defined. Two are based on the highest and lowest paid CEOs (TDC above 95th and below 5th percentile respectively), the remaining four buckets are bounded by the 25th, median and 75th percentile.

Table 3.28 Income categories

Income category	Lower boundary	Upper boundary
I	€ 0	€ 322,494
II	€ 322,494	€ 832,564
III	€ 832,564	€ 1,602,563
IV	€ 1,602,563	€ 2,963,581
V	€ 2,963,581	€ 7,259,527
VI	€ 7,259,527	∞

A mismatch is defined if reward (as measured by TDC-A) is above the median of the relevant bucket and risk (as measured by $\text{CompRisk}_{TDC} - 4A$) below the median and vice versa.

Table 3.29: Matching risk and reward

Risk / reward category	Risk/reward	Prevalence (numbers)	Prevalence (%)
Mismatch – A	-/+	259	21%
Match – B	+/+	349	29%
Match – C	-/-	345	28%
Mismatch – D	+/-	263	22%

In approximately 3/5th of the cases there is a match between risk and reward. In 2/5th of the cases the reward is above the median and risk below the median, or vice versa. In the mismatch category A, a further classification can be made. If a 'free-ride' would be identified as risk below the 25th percentile of the bucket and reward above the 75th percentile of the bucket, this results in 60 observations or 5% of the sample. Whether or not there is a situation of excess remuneration is difficult to establish. It can also be a proxy for individual characteristics. For example: the mean firm related wealth for the CEOs in this group is 189% higher than in the remaining sample (and 52% higher ownership expressed as a percentage of company stock). The tenure as CEO is also different. CEOs in the 'free-ride group' are on average 8.3 years in office versus 4.9 years in the remaining sample.

The human capital Sharpe Ratio – an introduction

An alternative way to compare pay packages is the use of the Sharpe ratio (1966, 1994). Drawback is that it requires a (risk free) human capital benchmark at the individual level and therefore may introduce noise. In order to provide an introduction to the use of the Sharpe ratio for human capital investment, and to provide insight in its relation to the CompRisk index, I will rework the CompRisk index for this purpose. Starting from the CompRisk index (divided by 100), the inverse is taken. The Sharpe Ratio is based on this metric and controls for a (risk free) benchmark level. The ex ante Sharpe ratio for a portfolio of financial assets is defined in equation 3.9.

$$\tilde{d} \equiv \tilde{R}_P - \tilde{R}_B \quad \textbf{[3.9a]}$$

$$S \equiv \frac{\bar{d}}{\sigma_d} \quad \textbf{[3.9b]}$$

The differential return is shown in 3.9a, where: R_p equals the return on the portfolio and R_B the return on a benchmark portfolio or security (such as a risk free investment). The tildes over the variables indicate that the exact values may not be known in advance. The ex ante Sharpe ratio is defined in equation 3.9b, where: d-bar stands for the expected value of d and sigma$_d$ the predicted standard deviation of d.[168] In order to get an approximation of the Sharpe ratio for human capital investments, the returns are translated in terms of rewards. R_p transforms into the reward for investing human capital (i.e. total direct compensation) and σ_p equals the standard deviation of these rewards. R_B, the benchmark reward, can be established by the lowest income level that is observed in the sample and equals € 145,135. This level is in the same ballpark as the constant factor of 11.98918 or € 161,003, in a regression of the (natural logarithm transformed) TDC level based on the ratio of variable pay to total direct compensation (t-statistic of 313.39). In other words, this is the level of compensation at 0% variable pay and therefore the guaranteed level of compensation if the CEO would choose for a risk free reward in return for the investment of his human capital. The complication is that there are different CEOs with different ability. Effectively this separates the CEO labour market in different segments. Therefore, the results will be based on the six income categories as previously defined.[169] To account for the individual differences between CEOs within the same category, the benchmark is defined at the individual level. For each person, the (risk free) benchmark is calculated as the sum of base salary plus half of his target variable compensation.[170] As a robustness check on the calculations, I also use an exchange ratio between fixed and variable pay of 1:3 and 1:4. Graph 3.9 shows the results of the calculation of the reward-to-variability ratios.

---

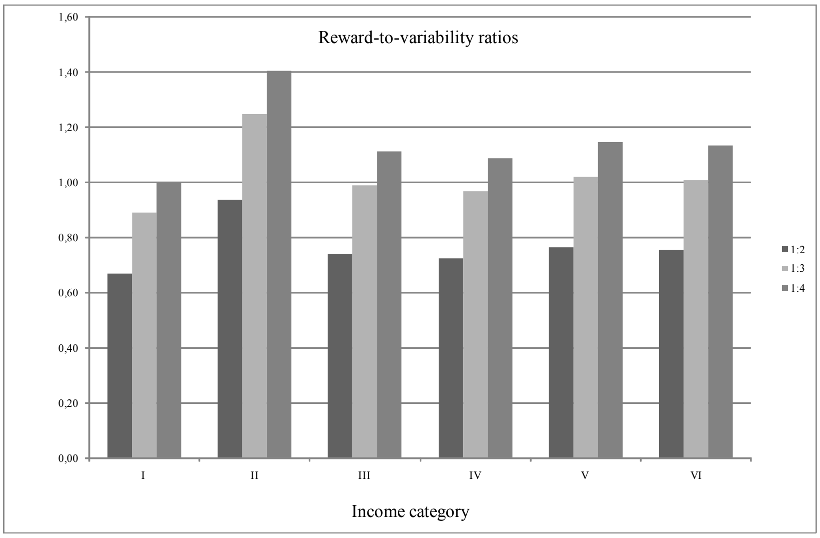
[168] If the benchmark portfolio has a fixed return of R_B, the standard deviation of 'd' equals the standard deviation of R_P.

[169] Separate regressions are run for each income category. The constant factors may be used as the riskless benchmark per group. However, because the prevalence of variable pay is higher in the highest income groups, differences in the R^2 of the regressions are found as well as differences in the significance of the constant factor. Because there is always the risk that income categories are not adequately selected (do not define a group of CEOs with similar ability), an individual benchmark proxy for riskless investment of human capital is used.

[170] This is a proxy for the certainty equivalence.

Graph 3.9 Overview of reward-to-variability ratios

This graph shows the median reward-to-variability ratios for each income category I to VI. Ratios are calculated based on equation 3.9. TDC and its variability are based on alternative A for the long-term incentive (see section 3.2.2.2), and four year historical data for the short-term incentive (see section 3.2.2.1).



Graph 3.9 details the conclusion from the regression results. It shows that reward-to-variability ratios are similar between the categories. Testing of the significance of differences is based on the Mann-Whitney test[171] and an equality of medians test.[172] The only category that shows a significant different pattern than the rest of the sample is income category II, which contains CEOs with an income between € 832,564 and € 1,602,563. Significantly higher ratios are observed in comparison to the other categories. These CEOs are able to negotiate a higher reward for each unit of risk.

Concluding

In conclusion, higher-income-CEOs are typically linked to greater compensation risk (as measured by the CompRisk index). After controlling for income level, a significant higher reward is found for each unit of risk, within income category II. In this section it was shown that the CompRisk index can be used to detect a mismatch between risk and reward. Such a mismatch is not necessarily a value destroying action given the fact that it can also reveal something about the risk aversion of the CEO. However, it is a situation that the remuneration committee should carefully monitor. The tool can further provide information about the absolute

[171] Tests the hypothesis that two independent samples (i.e., unmatched data) are from populations with the same distribution using the Wilcoxon rank-sum test, (Wilcoxon 1945; Mann and Whitney 1947).

[172] A nonparametric sample test on the equality of medians. It tests the null hypothesis that the samples were drawn from populations with the same median. The chi-squared test statistic is computed both with and without a continuity correction.

level of risk in the package. In some cases risk exposure may go beyond efficient levels. This can be shown from an ex-ante and an ex-post perspective.

- Ex ante: given a certain level of ex-ante compensation, risk-averse executives are only willing to be exposed to a certain level of risk. If the company wants to expose them to more risk at the same compensation level, they will do anything in their power to reduce the risk (including sandbagging the budget process, creating the perception that certain targets can never be met, etc.).
- Ex post: the company increases risk faced by the executive and also increases compensation level in order to get the executive to accept this deal. If this creates a situation where there is too much at stake for the executive (e.g. being able to become financially independent if the target is met), executives will strive to reach this target, which may include long-run value-destroying actions.

In other words, too much of a good incentive can provide an incentive to destroy rather than to create company value. Because it is difficult to establish the adequate level of compensation risk in isolation, one can make a relative measurement as a way of detecting compensation risk beyond the level of direct competitors. Such a benchmark can be a starting point to assess the quality of corporate governance. In a situation of weak company governance, the probability of bad behaviour increases.

3.4.2 Drivers of compensation risk

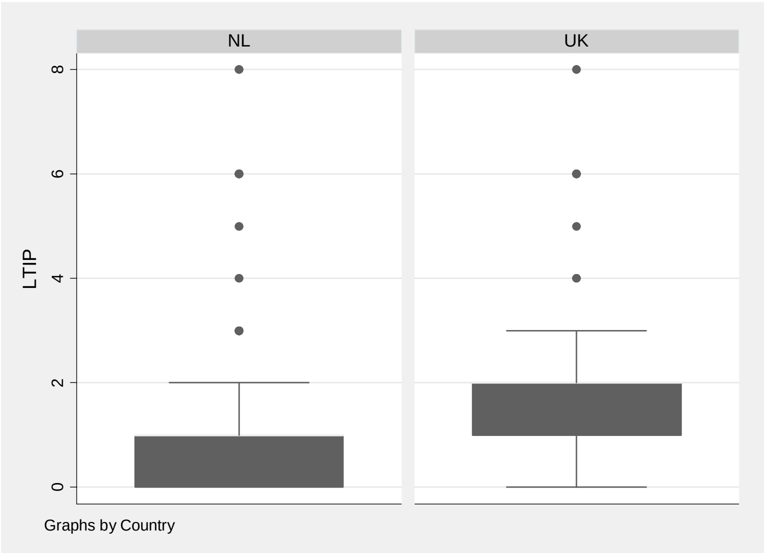
In this section, the drivers of the level of risk are discussed. By running a deterministic regression, a better understanding is obtained of these drivers and a simplified formula is established to determine (a proxy of) the CompRisk index. This could be an aid for future research. Furthermore, practitioners can follow this route if time and/or cost considerations prevent them from running a comprehensive CompRisk analysis.

The time consumption and complexity are chiefly related to the (simulations for the) long-term incentive. One can obtain the fixed compensation amount directly. Equations 3.3b and 3.3c showed that the greater the amount of fixed compensation, the lower the risk for the executive. One can also obtain the risk of the short-term incentive directly by running the coefficient of variation over an historical period (e.g. 3, 4 or 5 years). The long-term incentive requires simulation and is the most elaborate part. In order to increase practicality and circumvent the necessity of a simulation, I run a deterministic regression to obtain a regression formula for $CompRisk_{LTI}$. If a high R^2 is obtained, the fitted values will be a good predictor of the actual $CompRisk_{LTI.}$

3.4.2.1 Deterministic regression - $CompRisk_{LTI}$

The CRI of the LTI is established through simulation. The process of calculating the input parameters and running the simulations is time-consuming, as shown in the five step process of section 3.2.2.2. The analysis per company-year typically takes between 2 and 8 hours, depending on the number of LTI plans the company has. The number of plans per firm-year is reflected in graph 3.10. In the Netherlands fewer LTI combinations are observed.

Graph 3.10: Distribution of the number of LTI plans per firm-year



Each simulation is executed twice, based on ‘alternative A’ and ‘alternative B’ for input parameter calculation. The total number of firm-years is 1,216. In 1,034 of the cases, there are one or more LTI plans. The number of LTI plan simulations equals 1,738 under alternative A and the same amount under alternative B. This results in a total number of 3,476 simulations. Based on the 1,034 combined valuations and the midpoint of 5 hours per company-year, the total calculation/ simulation time equals 5,170 hours or 2.5 years (based on a 40-hour workweek and 52 weeks per year). Given the time-intensiveness of running these simulations, our objective is to establish a formula, based on deterministic regression, in order to obtain a good proxy of the $CompRisk_{LTI}$ index. The results can furthermore provide insight into the drivers of compensation risk.

LTI vehicles

Four types of payout are distinguished: cash, shares, deferred shares, options. If all 4 (or even 3) weights in the regression model are included, this would result in multicollinearity problems. I will therefore take the base case of an LTI in (performance) shares. In relation to shares, it is expected that a greater weight of options increases compensation risk (given the asymmetrical payout structure). The weight of deferred shares may increase or decrease compensation risk. Because performance measurement is less stringent in comparison to ordinary performance shares, it is most likely that the correlation will be negative. The weight of options and deferred shares is included in the regressions. Because cash in itself has no volatility, it takes on the risk of the underlying performance measure. This is accounted for in the volatility parameter of the underlying vehicle.

Volatility of vehicle

An increase in the underlying volatility of the company's share price increases compensation risk for the executive if payout of the LTI is equity related.[173] If the underlying vehicle is cash, a zero is recorded to reflect the fact that there is no exposure to the company's share price through the vehicle.

Volatility of the performance measure

Volatility also plays a role in the performance measurement. It is expected that a higher variation in the measure of performance results in a higher payout risk.[174] Since different measures of performance are observed, the underlying variation is expressed in terms of the coefficient of variation (for accounting return and growth measures) and volatility (for share price). A percentile ranking is used for each type of measure to obtain a single input factor.

Type of performance measure

In line with IFRS2 on the valuation of share-based payments, I distinguish between market-based and non-market-based performance measures. It is expected that if a greater percentage of the grant is linked to market-based conditions, the risk for the executive will be greater. Internal measures are closer to the sphere of influence of the CEO.

Number of performance measures & plans

It is expected that the use of a greater number of performance measures reduces the risk for the executive. In case of one measure of performance, the result is binary (good or bad). It is impossible to compensate bad performance on one measure with good performance on another.

---

[173] In the model, a regressor is included that captures the volatility of the underlying vehicle (i.e. the relevant share-price return volatility in the case of equity-based compensation and zero in the case of cash).

[174] This is typically the case. However, if the company sets extraordinarily challenging targets, an increase in the variation of the measure of performance could actually result in greater probability of reaching this stretching target. Stulz (1996) has shown that these companies will not hedge and actively pursue risky investment opportunities.

The number of LTI plans will have a similar effect. More plans (e.g. options and shares instead of only options) prevent a situation where ‘all your eggs are in one basket’.

Time

Time is a factor that influences compensation risk as well. It is expected that a longer vesting period increases the risk for the executive. In this period the LTI is conditional upon achievement of a certain level of performance. The longer the period, the more uncertainty arises (e.g. future business conditions, relevance of targets, personal situation, etc.). Time can also play a mitigating role. A longer exercise period after the vesting period for options reduces the risk for the executive. The executive has more time to choose a good moment to exercise the options. If options are underwater, time can prevent the options from lapsing and becoming worthless.

Other

One can attribute the remaining, unexplained variance to other factors. The most important is the target level and shape of the performance incentive zone. Because this is firm specific, it is impossible to take this into account in this general regression.

Table 3.30: Summary of expectations for the regression factors

Factor	Positive / negative effect
Weight of options	+
Weight of deferred shares	+/-
Volatility of the underlying vehicle	+
Volatility of the performance condition	+
Weight of market based condition	+
Number of performance conditions	-
Number of LTI plans	-
Vesting period	+
Remaining exercise period	-

The regression analysis is based on the combined dataset of alternative A and B to obtain the most robust results. This is possible given the fact that a deterministic regression will be run. The total number of observations equals 2,432 (2*1,216). In section 3.3 the problem of outliers was identified. To counter this, the CRI is transformed based on its square root.[175] Furthermore, extreme observations are taken out; i.e. observations with Cook’s D larger than 0.01[176] and

[175] Applying a logarithm is impossible given the fact that the CR can also equal zero.
[176] Total number of 24 observations

residuals larger than 4 times the standard deviation[177]. The remaining number of observations equals 2,391 (i.e. 98.3% of the sample). Tables 3.31 to 3.33 and graph 3.11 show the results. There is no collinearity in the model. The mean VIF equals 1.63. The highest individual VIFs are 2.24 and 2.25 for 'Vesting period' and 'Vehicle volatility', respectively. Table 3.31 shows that the highest correlation coefficient is between these two variables (0.6158).

Robustness checks

Besides OLS, I have run the same model using different robust estimation techniques, as reflected in appendix 3.4 (Huber-White sandwich estimator, resampling of observations based on bootstrap and jack-knife estimation and iteratively reweighted least squares).[178] The results of the robustness checks are consistent. All variables are significantly different from zero in the model, exhibit the same sign, and contribute to the explanation of $CompRisk_{LTI}$.

Table 3.31: Correlation coefficients

This table shows pair wise correlation coefficients. * $p<0.05$.

	Options	Deferred shares	Vehicle volatility	Performance volatility	Market weight	# of conditions	# of plans	Vesting period	Exercise period
Options	1								
Deferred shares	-0.2706*	1							
Vehicle volatility	0.4787*	0.0718*	1						
Performance volatility	0.0793*	-0.0260	0.4752*	1					
Market weight	-0.1147*	-0.0163	0.1939*	0.3611*	1				
# of conditions	-0.1048*	-0.0747*	0.0541*	0.2261*	-0.1136*	1			
# of plans	-0.0149	0.2101*	0.1471*	0.1064*	0.1085*	-0.1386*	1		
Vesting period	0.2687*	0.1632*	0.6158*	0.4570*	0.3724*	0.1939*	0.2519*	1	
Exercise period	0.4587*	-0.1331*	0.2732*	0.0572*	-0.0582*	-0.0322	0.0413*	0.1926*	1

[177] Total number of 17 observations

[178] Note: Although the $CompRisk_{LTI}$ equals zero if there is no LTI risk (e.g. no LTI plan or a cash payout without additional conditions), I have decided not to force the regression line through the origin (RTO). Regression through the origin (RTO) has the disadvantage of producing various irrelevant statistical parameters (e.g. the coefficient of determination, R^2, cannot be used to determine a good fit). I have therefore run a normal regression, taking observations with a CR LTI of zero into account. The resulting value of the constant factor equals 0.17 (square of 0.412) which approximates zero.

Table 3.32: Regression results $CompRisk_{LTI}$

This table shows the deterministic regression of $CompRisk_{LTI.}$ based on OLS regression. Robustness checks are reflected in appendix 3.3. The coefficient, p-value (within parentheses) and t-statistic are reflected. Stars stand for: * p<0.05; ** p<0.01; *** p<0.001.

Variable	Coefficient	t-stat
Options	.03305119***	34.88
	(0.0000)	
Deferred shares	-.01305476***	-11.77
	(0.0000)	
Vehicle volatility	.09969443***	41.67
	(0.0000)	
Performance volatility	.01537809***	14.79
	(0.0000)	
Market weight	.01116261***	12.97
	(0.0000)	
# of conditions	-.24956478**	-2.92
	(0.0036)	
# of plans	-.01783035**	-2.99
	(0.0028)	
Vesting period	.16201936***	55.37
	(0.0000)	
Exercise period	-.0129064***	-4.96
	(0.0000)	
_cons	.41208254***	6.25
	(0.0000)	
Observations	2391	
Adjusted R²	.92266625	

Graph 3.11: CompRisk fitted values (OLS) versus CompRisk observations

This graph shows the fitted values of the OLS regression versus the actual $CompRisk_{LTI}$ figures. The Pearson correlation coefficient equals 0.9601, significant at the 0.001 level.

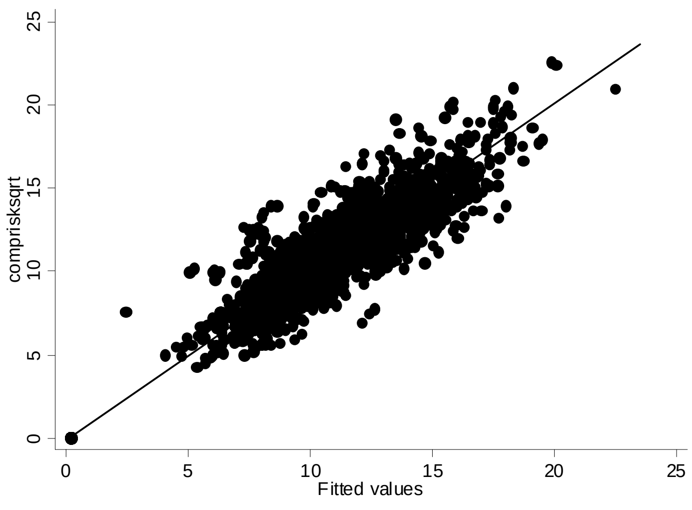


Table 3.33: Overview of variables plus ranking of the beta coefficient

This table shows the description of variables used in the regression. The standardised beta coefficient and the ranking of this coefficient are also reflected. It can be perceived as a ranking of the impact of the different variables. The beta coefficient is based on the regression coefficients, standardised to have a mean of 0 and standard deviation of 1.

Variable	Description	Ranking of standardised absolute beta coefficient	Beta
Vesting period	Weighted vesting period (in months)	1	.4712375
Vehicle volatility	Volatility of the underlying vehicle (in %)	2	.3554854
Options	Weight of options in the total LTI package (in %)	3	.2793544
Performance volatility	Volatility of the performance condition (in percentage rank)	4	.1063819
Market weight	Weight of market condition in the total package (in %)	5	.0903978
Deferred shares	Weight of deferred shares in the total LTI package (in %)	6	-.076844
Exercise period	Remaining exercise period after the vesting period (in months)	7	-.0319575
# of conditions	Dummy variable: 1 if each euro is governed by at least 2 performance conditions	8	-.0190514
# of plans	Number of LTI plans (square)	9	-.0182451

The results are in line with the expectations from table 3.30.[179] A proxy for the LTI can be obtained based on the obtained regression formula. Compensation risk for the TDC level can be calculated by combining this figure with the fixed compensation and the STI. In the next section, the drivers of TDC compensation risk are summarised.

3.4.2.2 Summary of the drivers of compensation risk

Below, I provide an overview of the factors that determine compensation risk (ceteris paribus) at the total direct compensation level and from a deterministic perspective. It can serve remuneration committees as a guide to the drivers of compensation variability / risk. Under the assumption that people respond to incentives, the compensation structure will impact the company's value.

1. The amount of fixed versus variable compensation: The greater the amount of fixed compensation (security) as a percentage of total compensation, the lower the risk for the executive;
2. Payout vehicle: Shares are riskier than cash, options are riskier than shares;

[179] In section 3.5 the determinants of the CompRisk index are researched, based on non-deterministic explanatory variables (individual, company, industry and country characteristics).

3. Volatility of the payout vehicle: The higher the share price volatility, the higher the risk for the executive;
4. Variation in performance condition: Greater fluctuations in company performance (market and non-market) impose a greater risk on the executive;
5. Type of performance condition: Market-based conditions are typically riskier than non-market based conditions due to the level of influence the executive has over the outcome of the measure of performance;
6. Number of variable compensation plans & performance measures: More plans and different types of measures to determine company performance prevent putting all eggs in one basket and thus limits risk;
7. Circuit breaker: The use of a circuit breaker in the variable component increases the risk for the executive. If the target under the circuit breaker is not achieved, the total payout is zero;
8. Target levels: Setting targets for the sake of variable compensation plans is typically the result of answering the following questions: a) What level of performance is expected (by shareholders and other stakeholders) and b) What do executives and supervisors believe that can actually be achieved? Setting targets that are too stretching imposes too much risk on the executive and might result in retention problems. This could, for example, stem from yearly growth targets that result in a 'hockey stick curve'. Setting targets that are too easy reduces the risk for the executive, but creates incomprehension and dissatisfaction among shareholders and other stakeholders. Setting the right targets is thus a balancing act;
9. Shape of the payout curve (or performance incentive zone): There is a difference between linear payout curves versus trenched/staged payout zones. The latter alternative exhibits kinks that create additional risk to the executive. At these points the relationship between one unit of additional performance and the associated level of payout is non-linear. This could create a situation where there is 'too much at stake' and even result in counterproductive behaviour.

3.5 Determinants of the CompRisk index

In the previous section 3.4, the drivers of the CompRisk index were established from a deterministic perspective. In this section, I will further explore its use for academic research. In the academic field, one can use the tool as input for various research projects. For example, one can use the tool as an exogenous variable to explain company performance, managerial risk taking, etc. It can also be used to reveal company-specific characteristics (e.g. as a proxy of the performance culture).

In this section, I will focus on the explanatory variables of compensation risk. In other words, which factors determine whether a company operates a certain incentive structure (e.g. low versus high risk)? We will refrain from using the deterministic variables defined in the previous section. The company chooses these variables that make up the structure of the plan (given the company's underlying risk). The objective is to find out which factors determine this choice.

3.5.1 Theory & hypothesis development

Our hypothesis is that explanatory factors can be based on individual, company, industry and country aspects. We primarily rely on factors that have been proven to explain CEO compensation. We assume that for a risk- and effort-averse agent, utility is increased if compensation is higher and risk is lower.

<u>Individual effects</u>

Tenure in the CEO position (-)

As tenure increases, the CEO is able to build influence within the firm, which may increase his political power. This power is related to the CEO's position in particular. The CEO might use this power to tie his compensation package more directly to his own preferences (Finkelstein and Hambrick, 1989; Hill and Phan, 1991; Cyert et al., 1997; Core, Holthausen and Larcker, 1999); higher pay at a given level of risk or lower risk at a given level of pay. It is therefore expected that there is a negative correlation between compensation risk and CEO tenure.

Compensation level (+)

Given a certain level of pay, the CEO is only willing to accept a certain level of risk (influenced by personal characteristics). It is expected that a higher risk will only be accepted if higher compensation can be earned. This trade-off between risk and return is expected to result in a positive correlation between pay level and pay risk (after controlling for the size of the company).

Ownership / firm related wealth (-)

In the certainty equivalence literature, firm related wealth is an important parameter because it can have a negative impact on the certainty equivalent of the uncertain payoffs that make up the remuneration package, Lambert et al. (1991). If firm related wealth is high, this may coincide with offering a less risky package to the CEO, given the exacerbated inefficiency between remuneration costs (shareholder perspective) and remuneration value (CEO perspective).

<u>Company effects</u>

Company size (+/-)

It is not expected that a specific relationship between firm size and compensation risk exists. We take firm size (through the natural logarithm of total assets) into account as a control variable.

Company performance (+)

If incentives are constructed to support value-enhancing behaviour, one would expect to see a positive correlation between high-performing companies and compensation risk. Performance is measured by Tobin's Q and relative total shareholder return.

Performance culture is difficult to measure. A company dummy will control for firm-fixed effects. Companies with a culture that focuses on pay-for-performance will have more pay at risk and subsequently a positive correlation with the CompRisk index.

Risk (+)

If the company exhibits greater risk, one would expect that variable pay will be influenced by this risk. We measure risk by the 'price swing' in a given year (highest minus lowest share price in the given year is divided by the midpoint).

The auditor may influence the risk culture of the company. The 'big four' (KPMG, Deloitte, Ernst & Young and PricewaterhouseCoopers) are recorded as dummy variables (KPMG left out to avoid collinearity).

CEO = Chair (-)

CEO duality is a proxy for the power of the CEO over the board and remuneration committee. When the CEO is also chairman, the extent of board control diminishes, and the CEO is better able to influence his compensation (Boyd, 1994; Core et al., 1999; Cyert, Kang and Kumar, 2002). This could result in lower risk.

Percentage of non-executive directors on the main board (+)

The number of non-executive directors as a percentage of the total number of directors is a measure of good governance. It is expected that a higher percentage of NEDs is associated with a stronger counterbalance for the CEO and thus linked to more compensation risk (reduction of free ride for the CEO).

Capital structure – debt ratio (-)

Capital structure can have a disciplining effect on management. If gearing is high, less pay at risk is needed because there is stronger oversight.

Presence of large external shareholder (+/-)

The presence of large external shareholders is related to the previous variable. Several researchers provide evidence that the monitoring performed by these large external shareholders reduce rent extraction by managers (Dyl, 1988; Cyert et al., 1997; Kraft and Niederprüm, 1999). Also, Gómez-Mejía et al. (1987) and Tosi and Gómez-Mejía (1989) determine that the incentives of CEOs and shareholders are better aligned when the company has a 5% external shareholder (i.e. greater compensation risk). An alternative hypothesis is that more effective external oversight reduces the need for strong incentives. Therefore, a neutral prediction is assumed.

Industry effects

A number of researchers state that the industry in which a firm operates may influence executive compensation levels (Agarwal, 1981; Balkin and Gómez-Mejía, 1987; Deckop, 1988; Boyd, 1994). Proxies for the level of diversification and industry fall out of the model when using firm-fixed effects. The relevance of industry affiliation is indirectly taken into account by calculating the relative total shareholder return (i.e. relative to the TSR performance of the other companies in the dataset and in the same ICB classification).

Country effects

La Porta, Lopez-de-Silanes and Shleifer (1999), Conyon and Murphy (2000) and Oxelheim and Randøy (2005) find that CEO compensation is higher in Anglo-Saxon firms than in continental European firms. Furthermore, it is expected that higher total compensation risk would be found in the UK than in the Netherlands in view of the acuter shareholder focus in the UK in comparison to the Netherlands. More aggressive incentives to increase shareholder returns would be in line with this. Country dummies fall out of the regression model, given the fact that company fixed effects are taken into account.

Time effects

Time dummies are included in the model to account for changes over time. Due to increased corporate governance requirements over the research period, in terms of tying pay to performance, it is possible that an increase in compensation risk will be found. From a theoretical perspective, there is a neutral expectation.

3.5.2 Data & methodology

The dataset was described in section 3.3. Given the issue of outliers, it is decided to winsorise observations below the 1st percentile and above the 99th percentile. The data can be considered an unbalanced panel. The end of the data for all companies equals 2008. The data go back to 2001, depending on their historical availability.[180] A Breusch Pagan Langrangian multiplier test is run for random effects (xttest0), which shows that the unit-specific error term is not zero (rejected at the 99.99% level). The Hausman specification test is also executed. Both provide indications that unit-fixed effects need to be applied to the model (units are companies in the sample and incorporated through the technique of absorbing indicators). Furthermore, since there are concerns with regard to the presence of serial correlation and heteroskedasticity, a robust regression scheme is applied, through the robust cluster option in STATA.

Table 3.34 Summary statistics of regression variables

This table shows the untransformed descriptive statistics of the explanatory variables used in the regressions in this section, in alphabetical order. To ensure, that figures are roughly in the same order of magnitude, the natural log is taken of the variables "CEO ownership", "TDC (A, B)" and "total assets", for purposes of the regressions. For a detailed overview of the description and source of the variables, see appendix 3.1.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Bank (%)	1216	3.566652	6.955562	0	44.7
CAPEX	1216	7.104592	12.22903	0	166
CEO ownership (€)	1216	2.03e+07	1.37e+08	0	3.15e+09
CEO tenure	1216	5.105263	5.886619	0	39
Debt-ratio	1216	41.72909	22.73369	0	99
Deloitte	1216	.1891447	.3917847	0	1

[180] Data availability (number of companies per year) 2008:161; 2007: 161; 2006: 161; 2005: 161; 2004: 161; 2003: 160; 2002: 146; 2001:105.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Ernst & Young	1216	.1463816	.3536338	0	1
Exec. Chair	1216	.0970395	.2961333	0	1
Individual (%)	1216	1.800123	7.865161	0	63.01
Industrial (%)	1216	3.574803	8.353063	0	60.57
Insurance (%)	1216	3.443853	5.46103	0	53
Investment (%)	1216	10.62867	12.23749	0	57.02
Listed (years)	1216	11.36678	4.460565	0	29
NED (%)	1216	40.10197	31.69161	0	100
New CEO year	1216	.140625	.3477773	0	1
No Remco	1216	.1225329	.3280352	0	1
Nom. Trust (%)	1216	6.116856	17.69153	0	100
Pension (%)	1216	.6157262	3.550016	0	39
Priceswing	1216	.514906	.2929718	.07658	188.016
PWC	1216	.3634868	.4812012	0	1
Relative TSR (%)	1216	-.0361842	27.93211	-100	183
TDC (A)	1216	2462629	3390865	145135	7.17e+07
TDC (B)	1216	2469669	3424590	145135	7.69e+07
Tobin's Q	1216	1.554363	.7837851	.6225	7.92301
Total assets (* mln €)	1216	72151.95	291079.6	18	3719582

All correlation coefficients are below 0.7. Because the mean VIF equals 1.99, with all individual factors below 7, there are no multicollinearity concerns.

3.5.3 Results of the analyses

The determinants of the CompRisk index of the total direct-compensation package are researched based on the 1,216 observations in the dataset. These observations are built up by the sum of fixed remuneration in combination with short- and long-term variable remuneration.

For the STI compensation risk the actual variation in bonus payouts, based on 4-year historical data (see section 3.2.2.1) is used.[181] For the LTI, the regression is based on alternative A (see section 3.2.2.2). In some years there is no LTI grant, (15% of the cases). This implies that the value of the LTI is zero, as is the risk associated with long-term compensation. In these cases, TDC is calculated based on the remaining two components: fixed compensation and short-term variable remuneration. Table 3.35 shows the results of the analysis. Robustness checks of the conclusions are executed in section 3.5.4.

[181] For each year, the weight is determined based on the STI weight in that year. The coefficient of variation is based on 4-year historical data. The dataset is bounded to the year 2001. If no 4 year data could be obtained a proxy is taken based on the average coefficient of variation for that company.

Table 3.35 Determinants of CompRisk$_{TDC}$ (ρ = 0)

This table shows the results of the regression for the CompRisk index of total direct compensation, based on alternative A for the long-term incentive (see section 3.2.2.2) and the STI on 4-year historical data (see section 3.2.2.1). The panel regression takes into account unit fixed effects at the company level. Estimation of standard errors is robust to disturbances being heteroskedastic and autocorrelated (observations are clustered per company). The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01. CompRisk, TDC, CEO ownership, and total assets are natural log transformed. Variables are reflected in the following groups; individual, company, industry, and time effects.

Variable	CompRisk - TDC 4AV A	
	Coefficient	t-stat
Individual effects		
TDC (A)	.95183157***	9.80
	0.0000	
CEO tenure	-.03894284***	-5.99
	0.0000	
New CEO year	.01587442	0.34
	0.7335	
CEO ownership (ln value €)	.00460929	0.70
	0.4848	
Company effects		
Nom. Trust (%)	-.00019271	-0.05
	0.9563	
Bank (%)	-.00667587	-1.63
	0.1053	
Insurance (%)	-.00957323	-1.62
	0.1077	
Investment (%)	-.00114288	-0.44
	0.6635	
Pension (%)	-.01873103	-1.37
	0.1730	
Industrial (%)	-.01125342***	-3.69
	0.0003	
Individual (%)	-.00492749	-0.48
	0.6324	
Total assets (ln)	.02817648	0.61
	0.5416	
Debt-ratio (sqrt)	.02541169**	2.39
	0.0179	
CAPEX	-.00177408	-0.97
	0.3328	
Tobin's Q	.09072721***	2.72
	0.0072	
Priceswing	-.00629322	-0.07
	0.9412	
PWC	-.33701409**	-2.05
	0.0416	
Ernst & Young	-.70343873*	-1.87
	0.0636	

Variable	CompRisk - TDC 4AV A	
	Coefficient	t-stat
Deloitte	-.0125442	-0.10
	0.9211	
Exec. Chair	.01491041	0.15
	0.8807	
NED (%)	-.00014829	-0.04
	0.9642	
Industry effects		
Relative TSR (%)	-.0005819	-1.10
	0.2712	
Time effects		
Time dummies (2003-2008)	*yes*	
_cons	-9.8950324***	-7.31
	0.0000	
Observations	1216	
Adjusted R^2	.6943527	

Below, the conclusions are stated in respect of table 3.35.

Individual effects

At the individual level, a significant correlation ($p<0.001$) is observed between compensation risk and level of remuneration. Economic intuition would support the notion of a correlation between risk and reward for human capital, similar to the trade-off between risk and return for portfolios of assets. Higher rewards for the CEO in the form of remuneration come at the cost of greater risk associated with the payout.

CEO tenure negatively correlates to compensation risk. The longer the CEO is in office, the less pay is 'at risk'. A possible explanation for this finding is taken from managerial power theory. From this perspective, tenure in the position is a power variable. Building up tenure is associated with building up power over remuneration decisions.

Company effects

Outside block holders seem to have similar demands regarding the link between pay and performance. However, companies that are owned for a greater part by industrial companies exhibit less compensation risk. A possible explanation for this phenomenon is that these parties give more attention to the dark side of strong incentives (which could induce risk-taking behaviour beyond the company's appetite) and focus on less risky investments based on this perspective. An alternative explanation is the reduced need for incentives if external oversight is stronger.

There is some evidence that companies with a greater debt ratio (higher gearing) exhibit a stronger link between pay and performance. The economic intuition that companies with more debt are already disciplined and need fewer incentives, is in line with the negative regression result between companies in the cross sectional regression of section 3.5.4 (robustness checks). The within companies effect of a positive correlation, found here, may be explained by movements within the 'debt category'. In this explanation, a company with low leverage with the ambition to produce greater returns for shareholders may increase gearing as well as incentives over time. For extreme cases (financial distress), this is also in line with Stulz (1996).

There is a correlation found between the Tobin's Q ratio and greater compensation risk for the CEO. This could indicate that high-performing companies believe in the power of incentives to obtain excellent business results. Alternatively, greater incentive strength causes better company performance as measured by the ratio between market value and book value of assets.

In terms of the auditors, the most significant correlation was found between PWC and lower CEO compensation risk (in comparison to KPMG, which is left out to avoid multicollinearity). Companies that have lower compensation at risk tend to choose PWC as their auditor and/or PWC tends to invest in becoming and remaining the auditor of these companies.

<u>Industry effects</u>

Because company-fixed effects were used, industry dummies and diversification-category variables fall out of the model. In order to obtain an industry effect, the industry-adjusted total shareholder return was calculated. Greater or lower industry-adjusted return does not significantly correlate to compensation risk. Earlier it was observed that, in absolute terms, there is a correlation between the CompRisk index and Tobin's Q. This might indicate that remuneration plans within industries are similar. In this explanation, competitors keep an eye on each other and provide similar incentives to their CEOs (also from the perspective of retention risk).

Country effects

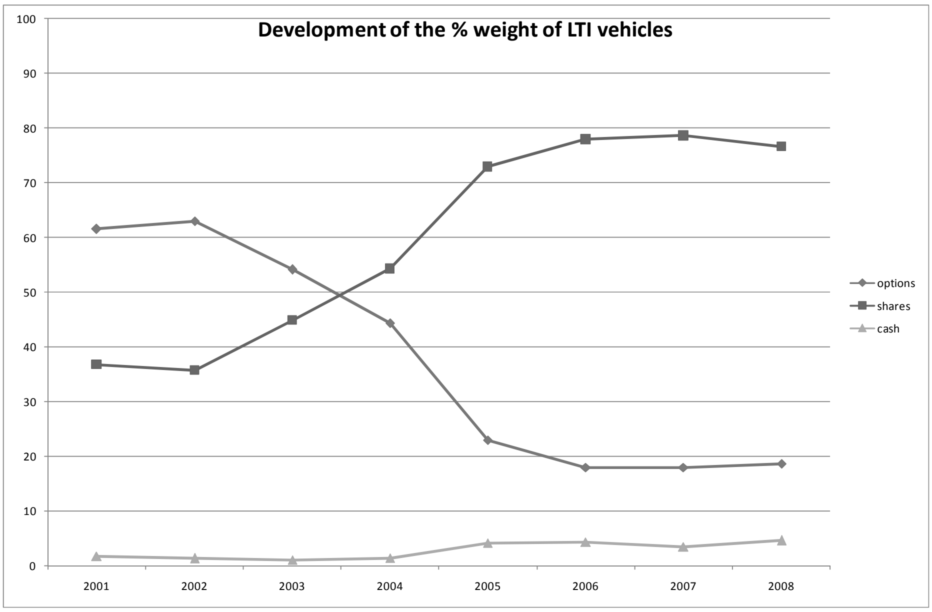
A specific country dummy was not incorporated in the model because it is part of the company fixed effects. In order to research country specific effects, I will calculate separate regressions for the UK and the Netherlands as part of the robustness checks presented in section 3.5.4.

Time effects

Time dummies were included in the regression analysis in which the years 2001 and 2002 were left out to avoid multicollinearity in this unbalanced panel dataset. Ceteris paribus, it is expected that time itself is not a significant determinant of compensation risk. However, changes over time can be picked up through this dummy. Year dummies are significant and the sign is negative. This implies that compensation risk has decreased over the research period. A possible explanation can be found in the use of long-term incentive vehicles. In the early years of the sample, a relatively high use of options is observed, whereas this prevalence decreases over time.

Graph 3.12-A: Average weight of the use of options, shares and cash per year

This graph shows the development of the weight of the 3 observed long-term incentive vehicles, options, shares and cash. Per year, the average weight is shown of the vehicle in the long-term incentive program.



Graph 3.12-A, shows that companies have reduced the weight of options in favour of shares, over the years.[182] Because shares have a lower payout risk than options, this could contribute to the explanation of the reduced compensation risk over time.

[182] This includes the use of deferred shares. The risk of deferred shares is often lower than that of stand-alone performance shares. The underlying reasoning is that these shares typically originate from the

3.5.4 Robustness checks

In the previous section, 7 conclusions were drawn based on the executed CompRisk regression analyses: TDC (+), CEO tenure (-), industrial % (-), debt-ratio (+), Tobin's Q (+), PWC (-), time effects (-). The objective for this section is to find out whether these conclusions still stand under different robustness checks and to allow for nuances (sign and significance). Appendix 3.5 panel A to E provides the results of the additional regressions.

Panel A

In panel A, the results of the same fixed effects model are shown, but now for seven different proxies of the CompRisk index. In the previous section 3.5.3 the CompRisk index was based on alternative A for the long-term incentive (see section 3.2.2.2) and 4 year historical data for the short-term incentive (see section 3.2.2.1). Appendix 3.5 shows additional calculations, based on 3-year and 5-year historical data for the STI, as well as the uniform distribution. In addition, it shows all of these proxies, but now based on alternative B for the long-term incentive calculation. All seven conclusions are supported by significant estimators with the same sign as found in the previous section.

Panel B

In panel B the assumption of no correlation between the STI and LTI payouts is abandoned. Panel B shows the regression results, based on the extreme correlation between the short- and long-term incentive (coefficients of minus 1 and plus 1 respectively). For perfectly positive correlation all conclusions are supported. The alternative with perfect negative correlation also supports the conclusions, with the exception of the debt-ratio (not significant). Note that the alternative in which $\rho = -1$ is highly unlikely. Given the different timing of payouts, no correlation is expected. If there is any correlation, this would generally be positive given the fact that short- and long-term incentives eventually support the same company objective of long-term value creation, e.g. I have never observed a situation in which the CEO was rewarded with put options on the company's share price.

Panel C

Panel C shows a cross sectional study. Because the dataset consists of eight years, regressions per year result in a maximum of 161 observations. To ensure robustness of the results, the regression is based on the average variable value per company over the research years. The adjusted R^2 of the cross sectional regression equals 64% versus 69% of the fixed effects model.

---

payout of the short-term incentive and therefore do not always include a performance condition. In such a case, if the CEO holds onto these shares for a certain period of time, the shares are matched at a predetermined ratio.

All, but two conclusions are supported. No significant correlation is found for the variable 'industrial %'. Furthermore, the positive correlation of debt-ratio in the fixed effects model turns into a significant negative correlation in the cross sectional model. The economic intuition that companies with more debt are already disciplined and need fewer incentives, is in line with the negative regression result, between companies. The within companies effect of a positive correlation may be explained by movements within the 'debt category'. In this explanation, a company with low leverage with the ambition to produce greater returns for shareholders may increase gearing as well as incentives over time.

Panel D and E

Panel D and E provide further insight in country specific factors. They show the fixed effects model as presented in table 3.35 of the previous section, but now split for the UK and the Netherlands. The UK regression in panel D supports all seven conclusions. The Dutch sample regression in panel E supports the sign of all conclusions. Five are significant: TDC (+), CEO tenure (-), industrial % (-), Tobin's Q (+), time effects (-). Not significant are the variables debt-ratio (t-statistic of 1.44) and PWC (t-statistic of -1.38). This could be the result of the fact that the sample is smaller than the UK sample (388 versus 657 observations).

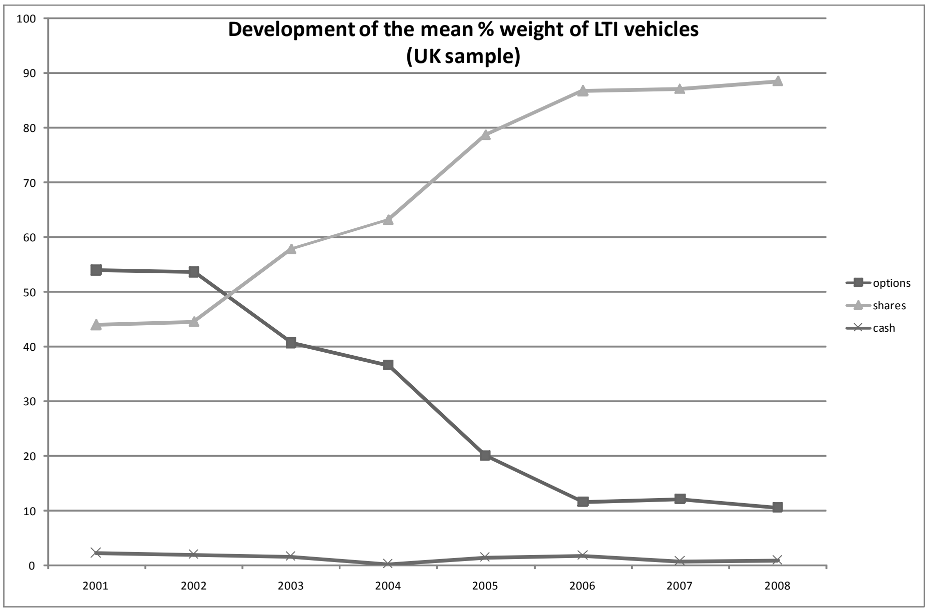
The country specific regressions can add to the explanation of observed nuances. For example, time dummies in both the UK as well as the NL sample are negative and significant. However, t-statistic significance for the Netherlands is lower and starts to be significant in 2005 in comparison to the UK which already shows significance in 2004. Graph 3.12 panel A showed the evolution of LTI vehicles for the total sample, in order to explain the negative evolvement of CompRisk over time. A more detailed inspection of the country specific vehicle evolution as shown in graph 3.12 panel B and C can explain the small differences between the UK and the Netherlands.

The UK t-stats might be higher given the fact that the abandonment of stock options in favour of shares is more pronounced in the UK sample than the Dutch sample (close to 90% use of shares versus close to 60% respectively at the end of the research period). Because shares have lower compensation risk than options, this can contribute to the explanation of decreasing compensation risk in the UK at the highest significance level ($p<0.001$).

The fact that significance is found for the time dummies 2005, 2006, 2007 and 2008, in the regression analysis for the Dutch sample, seems to be explained by panel C. The trend of switching options for shares reaches its high point in 2005 and stabilises in the years after.

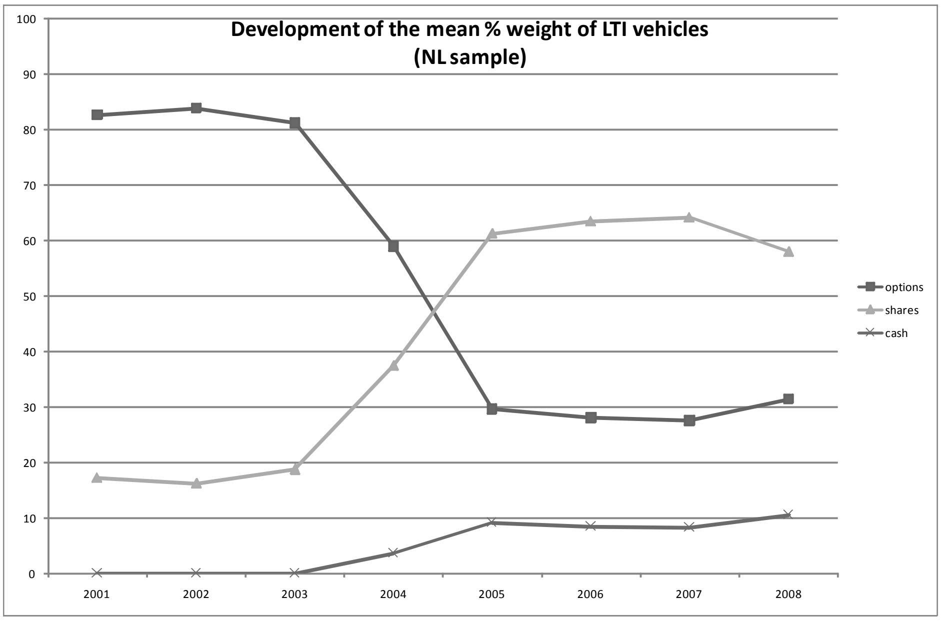
Graph 3.12-B: Average weight of the use of options, shares and cash per year

This graph shows the UK development of the weight of the 3 observed long-term incentive vehicles, options, shares and cash. Per year, the average weight is shown of the vehicle in the long-term incentive program.



Graph 3.12-C: Average weight of the use of options, shares and cash per year

This graph shows the Dutch development of the weight of the 3 observed long-term incentive vehicles, options, shares and cash. Per year, the average weight is shown of the vehicle in the long-term incentive program.



3.6 Summary & conclusion

Shleifer and Vishny (1997) conclude their survey on corporate governance by the following question, among others, for further research: 'Given the large impact of executive's actions on values of firms, why aren't very high powered incentive contracts used more often in the United States and the rest of the world?' Meanwhile, this question has been answered. Too much of a good incentive results in counterproductive behaviour. Incidence of backdating stock options,[183] misstatements, fraud, overvalued equity and financial distress have been linked to incentive strength, Denis et al. (2006), Bergstresser and Philippon (2006), Cullinan et al. (2006), Jensen (2004, 2005), Efendi, Srivastava and Swanson (2004), Tian (2004).

Measuring incentive strength (compensation at risk) is therefore important because it allows for conclusions on both sides of the trade-off. Within the dichotomy of portfolio- versus performance-incentives, I have focused on the latter from an ex ante perspective. A measure of compensation at risk that is typically used is the ratio between variable and fixed compensation. I have aimed to improve this proxy by taking underlying contract details into account. The following questions were researched:

1. How to define a single quantifiable metric that can capture the structure, risk or incentive strength of yearly compensation contracts?
2. What is the level of risk in real life compensation contracts in the Netherlands and the UK?
3. How can the CompRisk index be used?
4. What are the determinants of compensation risk, as measured by the CompRisk index?

3.6.1. Summary

Compensation risk is measured, based on the degree to which ex-post realisations of pay can differ from the ex-ante expected compensation. The coefficient of variation is used for this purpose (see equation 3.8a), in which μ_{TDC} equals the expected value of total direct compensation and σ_{TDC} the standard deviation of (potential) realisations.

---

[183] 'Het Financieele Dagblad' (1 June 2006) reports on backdating of option contracts in the United States. The SEC and the Justice Department started a criminal investigation of about 20 companies with regard to alleged manipulation of option programs. Several executives were fired based on these allegations. These executives had been granted options on a date when the company's share price was at a low. The suspicion was that these options had been backdated to this moment. An example was the general counsel at McAfee who was fired for receiving 20,000 options dated 14 April 2000 with an exercise price of $19.75. Later that month the share price rose to above $25. Another example is Vitesse Semiconductor, which fired three members of its executive board, including the CEO and CFO, who had repeatedly received options at low exercise prices just before a significant rise in the company's share price.

$$CompRisk_{TDC} = \frac{\sigma_{TDC}}{\mu_{TDC}} * 100$$

[3.8a]

The eventual compensation risk at the total direct-compensation level depends on the ratio between fixed and variable compensation as well as the structure of the short- and long-term incentive plan. In order to obtain robust research results, the proxy for compensation risk is calculated based on multiple ways to obtain the input parameters. For the long-term incentive, input is needed for simulation of the plan payouts (e.g. volatility, dividend yield, correlation coefficients of peers in the case of relative measurement of firm performance). The work is based on IFRS 2 valuations. These are executed by companies for accounting purposes and signed off on by the external auditor. Two historical periods were considered: A) 1-year historical data; B) an average of 1-, 3-, 5- and 10-year historical data. For the STI, the proxy for $CompRisk_{STI}$ is directly based on the STI outcomes from the past, using 3-, 4- and 5-year historical data. Given data limitations and in view of CEO turnover (69% of the CEOs in the dataset are in the position ≤ 5 years), no longer historical period was taken.

Typical ranges of STI, LTI and TDC compensation risk are reflected in table 3.36.

Table 3.36: Typical CompRisk ranges (ρ = 0)

This table shows an overview of the typical compensation risk ranges for the short-term incentive (STI), the long-term incentive (LTI), and total direct compensation (TDC). The $CompRisk_{STI}$ is based on 4 year historical data. The $CompRisk_{LTI}$ is based on input data under alternative A. The $CompRisk_{TDC}$ follows from these two calculations (4A). In addition, it is reflected for the STI based on the uniform distribution (UA).

Statistics	$CompRisk_{STI}$ (4)	$CompRisk_{LTI}$ (A)	$CompRisk_{TDC}$ (4A)	$CompRisk_{TDC}$ (UA)
25th percentile	18	80	22	22
50th percentile	35	118	33	33
Mean	46	135	37	42
75th percentile	67	162	48	49
N	575	1034	575	1216

Table 3.36 shows that short-term incentives are less risky than long-term incentives. $CompRisk_{TDC}$ therefore particularly depends on the weight and structure of the long-term incentive. To provide more insight into the determinants of LTI risk, a deterministic regression was run. The following factors explained the variation in $CompRisk_{LTI}$ (adjusted R^2 of 92%). Ranking is based on the standardised beta coefficient:

1. Vesting period: If the period in which the LTI is conditional upon employment and/or achievement of performance criteria is longer, the $CompRisk_{LTI}$ is higher;
2. Volatility of the underlying vehicle: Higher company volatility creates greater potential variation in the LTI payout;
3. Option weight: If the weight of options (in relation to shares) in the total LTI package is higher, this results in higher risk for the CEO;
4. Volatility of the performance condition: Higher volatility in the measures of performance results in higher risk;
5. Market condition: If the type of condition is linked to market performance (share price, total shareholder return), this creates greater risk for the CEO. Internal measures (such as cost control, accounting return, etc.) are more within his sphere of influence than the share price (which is also influenced by deviations of market expectations, sentiments, etc.);
6. Deferred shares weight: If the weight of deferred shares (in relation to other share plans) in the total LTI package is higher, this results in lower risk for the CEO. Deferred shares typically have no or weak performance conditions in relation to ordinary performance share plans;
7. Exercise period: If granted options have a longer exercise period, this limits the risk for the CEO. The CEO has a longer period to optimally time the exercise of his options. This is especially relevant if options are out-of-the-money. The probability that underwater options gain an intrinsic value is higher if the period until expiry is longer;
8. Number of performance conditions: A situation in which there are multiple performance measures (at least 2 per euro[184]) moves away from putting all one's eggs in one basket and reduces payout risk;
9. Number of LTI plans: A similar hedge applies if the number of different LTI plans increases.

Knowledge of the different drivers of compensation risk (fixed versus variable compensation and structure of the variable pay plans), puts remuneration committees in a position to make more informed decisions. Figure 3.5 confronts the compensation level with compensation risk and helps the visualisation of this. Based on six income categories, it was found that a mismatch (areas A and D), occurs in approximately 2/5th of the cases. In category A, a potential free-ride is possible. If a free-ride would be defined as a reward above the 75th percentile and risk below the 25th percentile, this would add up to 5% of the observations in the dataset. Companies that

[184] Satisfaction of dummy condition: If there is one LTI plan governed by two measures, this condition is satisfied. If there are two plans, one of which has two measures and the other of which has one measure, the criterion is not satisfied. If there is a third plan with three measures, depending on the weight of the different plans, the condition is or is not satisfied.

are situated in area D may have a potential retention or hiring issue because pay is below the median level and risk is above this level.

Figure 3.5: CompRisk matrix

This figure shows the CompRisk matrix. This matrix adds a dimension to traditional pay benchmarking. Typically, only the expected reward level (y-axis) is referenced against a group of peers. The additional risk classification, which can be based on the CompRisk index (x-axis), provides additional insight into the underlying structure of the remuneration package. The executive remuneration policy of a company can be classified in one of the reflected categories A till D.

Expected value of reward / **Risk – CompRisk Index**	Below median	Above median
Above median	**A** "Freeride"	**B** "Situation with significant risk; strong corporate governance is needed"
Below median	**C** "Low risk; attracts a risk averse individual"	**D** "Potential retention/ hiring issue"

The matrix can help from a socioeconomic perspective. In the past, the public and other stakeholders have scrutinised pay increases. Remuneration committees have defended these increases by pointing out that CEO pay is situated below the median of the reference market. By including the risk perspective, these grounds no longer suffice. If the company is in area C, there is little ground for an adjustment in isolation, because the compensation risk is also situated below the median.

In addition, for each income category, reward-to-variability ratios (based on the Sharpe ratio) were calculated. The calculations control for an individual risk free benchmark. Minor differences are observed per category in terms of the reward that is earned per unit of risk. Only category II, which contains CEOs with an income between € 832,564 and € 1,602,563, shows significantly higher median ratios.

In the final part of this study, it was researched whether the observed trade-off between pay level and pay risk is also supported through regression analyses. Table 3.37 shows an overview of the significant determinants of compensation risk, as well as the associated economic effects.

Table 3.37: CompRisk$_{TDC}$ regression results – economic effects

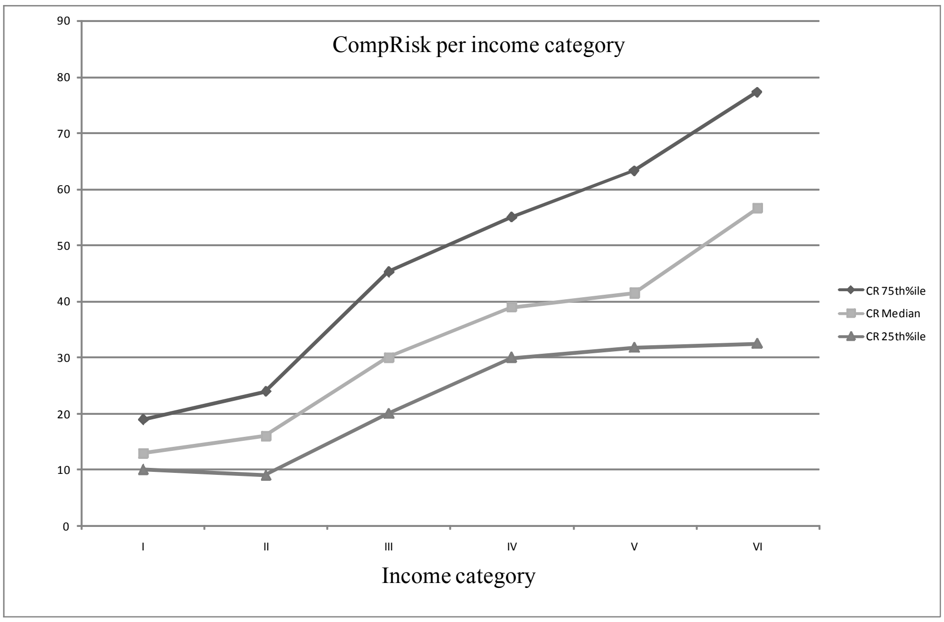
This table shows an overview of the significant variables in the CompRisk$_{TDC}$ regression. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01.

	CompRisk - TDC 4AV A	
Variable	Significance	Economic effect
CEO tenure	***	-0.23
Debt-ratio (sqrt)	**	0.06
Dummy 2004	***	-0.22
Dummy 2005	***	-0.41
Dummy 2006	***	-0.53
Dummy 2007	***	-0.53
Dummy 2008	***	-0.44
Ernst & Young	*	-0.70
Industrial (%)	***	-0.09
PWC	**	-0.34
TDC (A)	***	0.89
Tobin's Q	***	0.07

The highest economic effect and the highest t-stats are found for the variable Total Direct Compensation. This positive and significant correlation between pay level and pay risk is illustrated in graph 3.13, for the six income categories as defined in this chapter (I to VI). Higher income CEOs are linked to higher compensation risk.

Graph 3.13: Risk versus reward based on 6 income categories

This graph shows the 25th, 50th and 75th CompRisk$_{TDC}$ figures per income category (I to VI). Income categories are defined in table 3.28. CompRisk is based on scenario A for the long-term incentive and the STI based on a 4-year historical period.



3.6.2 Conclusion

In this section 5 conclusions are provided that are based on the regression in section 3.5. The listed conclusions are supported by multiple robustness checks. We discuss the following themes:

1) The executive remuneration decision – balancing risk & reward

2) Do high-performing companies believe in the pay-for-performance adage?

3) Managerial power and compensation risk

4) Country effects – the importance of a holistic approach

5) Time effects – replacing options with shares

1) The executive remuneration decision – balancing risk & reward

This chapter has researched the correlation between pay risk and reward. A significant correlation between risk level and pay level was found. This could imply that CEOs are only willing to accept higher risk if this coincides with a higher level of expected pay or that higher expected pay can only be justified to stakeholders if the associated pay risk increases as well. It is thus concluded that risk is higher in the higher income categories. After controlling for the individual benchmark level, one would expect to see no or limited differences. This indeed is the case; reward-to-variability ratios (based on Sharpe, 1966, 1994) show similarity between the 6 defined income categories (see section 3.4.1). The only category that shows a significant different pattern than the rest of the sample is income category II, which contains CEOs with an income between € 832,564 and € 1,602,563. These CEOs receive a significantly higher reward for each unit of risk. This may indicate that competition is strong in this segment of the CEO labour market, which causes remuneration committees to bid up against each other. In general, it is concluded that the remuneration committee has the task to balance risk and reward, such that company objectives are supported.

2) Do high-performing companies believe in the pay-for-performance adage?

The regression results in section 3.5 show that there is a significant and positive correlation between Tobin's Q and the $CompRisk_{TDC}$ index. Duffhues (2006) describes Tobin's Q as an important report mark for the organisation. Companies with a higher report mark tend to use greater incentive strength. An alternative explanation is that companies with a stronger link between pay and performance perform better as measured in terms of Tobin's Q.

3) Managerial power & compensation risk

Economic logic would dictate that the utility of a CEO is positively related to the level of compensation and negatively related to the risk associated with this remuneration. The results in the following chapter 4, support the first part of this statement. There, it is established that the only real CEO power variable that positively and significantly correlates to excess remuneration is CEO tenure. The longer the CEO is in his position, the more power he obtains to set compensation to increase his utility. With regard to the second part of the statement anecdotal evidence was found in section 3.4.1. If a 'free-ride' would be identified as a mismatch between risk and reward such that risk is below the 25th percentile of the income category and reward above the 75th percentile of the range, this results in 60 observations or 5% of the sample. The tenure in this 'free-ride group' is on average 8.3 years as opposed to 4.9 years for the remaining part of the sample. Further support was found in the regression analysis of section 3.5.3. The tenure of the CEO negatively correlates to the remuneration risk as measured by the CompRisk index.

4) Country effects - the importance of a holistic approach

In this chapter the top end of the UK and Dutch markets were researched with respect to compensation risk related to the short-term incentive, the long-term incentive and total direct compensation. The analysis in section 3.3 showed that a holistic approach is needed, when it comes to assessing compensation risk. Summing up the relative STI and LTI positioning does not result in the correct conclusion for TDC. The UK shows similar compensation risk for the STI and lower compensation risk for the LTI. When viewed in isolation, the sum would result in overall lower compensation risk at the TDC level. However, as a result of an overall higher weight of variable pay in the UK, the risk of total direct compensation is higher. All direct compensation elements should therefore be taken into account to reach meaningful conclusions.

5) Time effects – replacing options with shares

Time dummies (2003-2008) are included in the regression analysis. Ceteris paribus, it is expected that time itself is not a significant determinant of compensation risk. However, changes over time can be picked up through this dummy. The year dummies are significant and the sign is negative. This implies that compensation risk has decreased over the research period. A possible explanation can be found in the use of long-term incentive vehicles. In the early years of the sample, a relatively high use of options is observed. In the year 2001, the (average) weight of options in the LTI program equalled 61.5% versus 36.8% in shares. At the end of the research period, these figures were 18.7% and 76.6%, respectively. Because shares have a lower payout risk than options, this has contributed to decreased compensation risk over time.

3.6.3 Future research

There are various areas that one can explore further. In this chapter, I have used the CompRisk index as an endogenous variable and focused on the direct compensation elements (base salary, bonus, long-term incentive). Alternatively, the CompRisk index can be used as a right-hand-side variable, for example, in empirical work that researches the determinants of company performance or managerial risk taking. It can be used as a proxy for company (performance) culture or CEO risk aversion. With ongoing improvements in remuneration disclosure in Europe, one will be able to use the index to explore different countries and add other remuneration elements (such as benefits).

3.7 References

Aboody, D., Kasznik, R. (2000), 'CEO Stock Option Awards and the Timing of Corporate Voluntary Disclosures', *Journal of Accounting and Economics* 29, 73-100.

Agarwal, N.C. (1981), 'Determinants of Executive Compensation', *Industrial Relations* 20, 36-45.

Aggarwal, R.K., Samwick, A.A. (1999), 'The Other Side of the Trade-off: The Impact of Risk on Executive Compensation', *Journal of Political Economy* 107, 65–105.

Agrawal, A., Makhija, A.K., Mandelker, G. (1991), 'Executive Compensation and Corporate Performance in Electric and Gas Utilities', *Financial Management* 20, 113–124.

Agrawal, A., Mandelker, G.N. (1987), 'Managerial Incentives and Corporate Investment and Financing Decisions'. *Journal of Finance* 42, 823–837.

Baker G.P. (2002), 'Distortion and Risk in Optimal Incentive Contracts', *The Journal of Human Resources* 37, 728-751.

Baker, G. (1992), 'Incentive Contracts and Performance Measurement', *Journal of Political Economy* 100, 598-614.

Balkin, D.G., L.R. Gómez-Mejía (1987), 'Toward a Contingency Theory of Compensation Strategy', *Strategic Management Journal* 8, 169-182.

Bebchuk, L.A., J.M. Fried (2005), 'Pay Without Performance: Overview of the Issues', *Journal of Applied Corporate Finance* 17 (4), 8-23.

Bebchuk, L.A., Jackson, R.J. (2005), 'Executive Pensions', *Journal of Corporation Law* 30, 823-855.

Becker, B. (2006), 'Wealth and Executive Compensation', *The Journal of Finance* Vol LXI, 379-397.

Bergstresser, D., Philippon, T. (2006), 'CEO Incentives and Earnings Management', *Journal of Financial Economics* 80, 511-529.

Bernoulli, D. (1738), 'Exposition of a New Theory of the Measurement of Risk' (Sommer, L. Trans. (1954)), *Econometrica*, 22, 23–26.

Black F, Scholes M. (1973), 'The Pricing of Options and Corporate Liabilities', Journal *of Political Economy* 81, 637–654.

Boyd, B.K. (1994), 'Board Control and CEO Compensation', *Strategic Management Journal* 15 (5), 335-344.

Burns, N., Kedia, S. (2006), 'The Impact of Performance-Based Compensation on Misreporting'. *Journal of Financial Economics* 79, 35-67.

Cadman, B., Carter, M.E., Hillegeist, S. (2010), 'The Incentives of Compensation Consultants and CEO Pay', *Journal of Accounting and Economics* 49, 263-280.

Chauvin, K.W., Shenoy, C. (2001), 'Stock Price Decreases Prior to Executive Stock Option Grants', *Journal of Corporate Finance* 7, 53-76.

Chen, C.R., Steiner, T.L., Whyte, A.M. (2006), 'Does Stock Option-Based Executive Compensation Induce Risk-Taking? An Analysis of the Banking Industry', *Journal of Banking and Finance* 30, 915-945.

Coles, J.L., Daniel, N.D., Naveen, L. (2006), 'Managerial Incentives and Risk-Taking', *Journal of Financial Economics* 79, 431–468.

Coles, J.L., Naveen, D.D, Naveen, L. (2006), 'Managerial Incentives and Risk-Taking', *Journal of Financial Economics* 79, 431-468.

Conyon, M., Peck, S., Sadler, G. (2009), 'Compensation Consultants and Executive Pay: Evidence from the United States and the United Kingdom', *Academy of Management Perspectives* 23, 43-55.

Conyon, M.J., K.J. Murphy (2000), 'The Prince and the Pauper? CEO Pay in the U.S. and the U.K.', *Economic Journal* 110, 640-671.

Core, J.E., Holthausen, R.W., Larcker, D.F. (1999), 'Corporate Governance, Chief Executive Officer Compensation, and Firm Performance', *Journal of Financial Economics* 51, 371–406.

Core, J., Guay, W. (2002), Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility, *Journal of Accounting Research* 40, 613-630.

Coughlan, A.T., Schmidt, R.M. (1985), 'Executive Compensation, Management Turnover, and Firm Performance', *Journal of Accounting and Economics* 7, 43–66.

Cox, J.C., Ross, S.A., Rubinstein, M. (1979), 'Option Pricing: A Simplified Approach', *Journal of Financial Economics* 7, 229-263.

Cullinan, C.P., Du, H., Wright, G.B. (2006), 'A Test of the Loan Prohibition of the Sarbanes-Oxley Act: Are Firms that Grant Loans to Executives More Likely to Misstate their Financial Results?', *Journal of Accounting and Public Policy* 25, 485-497.

Cyert, R., Kang, S., Kumar, P. (2002), 'Corporate Governance, Takeovers, and Top-Management Compensation: Theory and Evidence', *Management Science* 48 (4), 453-469.

Cyert, R., Kang, S., Kumar, P., Shah, A. (1997), 'Corporate Governance and the Level of CEO Compensation', *Working Paper*, Carnegie Mellon University.

Deckop J.R. (1988), 'Determinants of Chief Executive Officer Compensation', *Industrial and Labor Relations Review* 41 (2).

DeFusco, R.A., Johnson, R.R., Zorn, T.S. (1990), 'The Effect of Executive Stock Option Plans on Stockholders and Bondholders', *Journal of Finance* 45, 617–627.

DeFusco, R.A., McLeavey, D.W., Pinto, J.E. Runkle, D.E., Anson, M.J. (2007)', Quantitative Investment Analysis 2nd edition, 1-600.

Denis, D.J., Hanouna, P., Sarin, A. (2006), 'Is There a Dark Side to Executive Compensation?', *Journal of Corporate Finance* 12, 467-488.

Duffhues, P.J.W., Jobsen, M. (2006), Imperfecties op de Arbeidsmarkt voor Topbestuurders, (in Dutch), *ESB* 91, 3 November 552-555.

Dyl, E.A. (1988), 'Corporate Control and Management Compensation', *Managerial and Decision Economics* 9, 21-25.

Eaton, J., Rosen, H. (1983), 'Agency, Delayed Compensation and the Structure of Executive Remuneration', *Journal of Finance* 38, 1489-1505.

Edwards, W. (1954), 'The Theory of Decision Making', *Psychological Bulletin*, 51(4), 380–417.

Efendi, J., Srivastava, A., Swanson, E.P. (2007), 'Why Do Corporate Managers Misstate Financial Statements? The Role of Option Compensation and Other Factors', *Journal of Financial Economics* 85, 667-708.

Evans, M., Hastings, N., Peacock, B. (2000), Statistical Distributions, Wiley, 1-221

Fich, E.L., A. Shivdasani (2006), ‘Are Busy Boards Effective Monitors?’ *The Journal of Finance* 61 (2) 689-724.

Finkelstein, S., D.C. Hambrick (1989), ‘Chief Executive Compensation: A Study of the Intersection of Markets and Political Processes’, *Strategic Management Journal* 10: 121-134.

Goldberg, L.G., Idson, T.L. (1995), ‘Executive Compensation and Agency Effect’, *Financial Review* 30, 313–335.

Gómez-Mejía, L.R., Tosi, H., Hinkin, T. (1987), ‘Managerial Control, Performance, and Executive Compensation’, *The Academy of Management Journal* 30 (1), 51-70.

Gray, S., Cannella, A. (1997), ‘The Role of Risk in Executive Compensation’, *Journal of Management* 23, 517-540.

Grund, C., Sliwka, D. (2010), ‘Evidence on Performance Pay and Risk Aversion’, *Economics letters* 102. 8-11.

Guay, W. (1999), ‘The Sensitivity of CEO Wealth to Equity Risk: An Analysis of the Magnitude and the Determinants’, *Journal of Financial Economics* 53, 43-78.

Hemmer, T., Kim, O., Verrecchia, R.E., (1999), Introducing Convexity Into Optimal Compensation Contracts, *Journal of Accounting and Economics* 28, 307-327.

Hill, C.W.L., Phan, P. (1991), ‘CEO Tenure as a Determinant of CEO Pay’, *Academy of Management Journal* 34 (3), 707-717.

Hwang, L., Lilien, S. (2000), ‘CEO Stock-Based Compensation: An Empirical Analysis of Incentive-Intensity, Relative Mix, and Economic Determinants’, *The Journal of Business* 73, 661-693.

International Accounting Standards Board (IASB) (2004), IFRS 2 Share-Based Payment, International Financial Reporting Standard (1-51), Guidance on Implementing (1-33).

Jensen, M., Murphy, K., Wruck, E. (2004), ‘Remuneration: Where We’ve Been, How We Got There, What Are the Problems, and How Do We Fix Them’. Working paper, *Harvard Business School*, *University of Southern California*, and *Econalytics*.

Jensen, M., Murphy, K.J. (1990a), ‘Performance Pay and Top Management Incentives’, *Journal of Political Economy* 98, 225–264.

Jensen, M., Murphy, K.J. (1990b), ‘CEO Incentives—It Is Not How Much You Pay, but How’, *Harvard Business Review* 68, 53–69.

Jensen, M.C. (2005), ‘The Agency Costs of Overvalued Equity’, *Financial Management* 34, 5-19.

Kabir, R., Minhat, M. (2010), ‘Multiple Compensation Consultants and CEO Pay’, *SSRN working paper 1646926*.

Kahneman, D., Tversky, A. (1979), ‘Prospect Theory: An Analysis of Decision Under Risk’, *Econometrica*, 47(2), 263–291.

Kahneman, D., Tversky, A. (1992), ‘Advances in Prospect Theory: Cumulative Representation of Uncertainty’, *Journal of Risk and Uncertainty* 5, 297–323.

Kalyta, P., Magnan, M. (2008), ‘Executive Pensions, Disclosure Quality, and Rent Extraction’, *Journal of Accounting and Public Policy* 27, 133-166.

Kerr, S. (1975), ‘On the Folly of Rewarding A, While Hoping for B’, *Academy of Management Journal* 18, 769-783.

Kraft, K., A. Niederprüm (1999), 'Determinants of Management Compensation with Risk-Averse Agents and Dispersed Ownership of the Firm', *Journal of Economic Behavior and Organization* 40, 17-27.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (1999), 'Corporate Ownership Around the World', *Journal of Finance* 54, 471-517

Laan, G. van der (2008), 'Behavioral Corporate Governance: Four Empirical Studies', *Theses in Economics and Business*, University of Groningen, 1-145.

Leonard, J.S. (1990), 'Executive Pay and Firm Performance', *Industrial and Labor Relations Review* 43.

Lewellen, W., Loderer, C., Martin, K. (1987), 'Executive Compensation and Executive Incentive Problems', *Journal of Accounting and Economics* 9, 287–310.

Low, A. (2009), 'Managerial Risk-Taking Behaviour and Equity-Based Compensation', *Journal of Financial Economics* 92, 470-490.

Malmendier, U., Tate, G.A. (2009), 'Superstar CEOs', *Quarterly Journal of Economics* 124, 1593-1638.

Mann, H.B., Whitney, D.R. (1947), 'On a Test of Whether One of Two Random Variables Is Stochastically Larger than the Other', *Annals of Mathematical Statistics* 18, 50-60.

Mehran, H. (1995), 'Executive Compensation Structure, Ownership, and Firm Performance', *Journal of Financial Economics* 38, 163–184.

Merton, R. (1973), 'Rational Option Pricing', *Bell Journal of Economics and Management Science* 4, 373–413.

Oxelheim, L., Randøy, T. (2005), 'The Anglo-American Financial Influence on CEO Compensation in Non-Anglo-American Firms', *Journal of International Business Studies* 36 (4): 470-483

Rabin, M. (2003), 'The Nobel Memorial Prize for Daniel Kahneman', *Scand. J. of Economics* 105, 157-180.

Rajgopal, S., Shevlin, T. (2002), 'Empirical Evidence on the Relation Between Stock Option Compensation and Risk Taking', *Journal of Accounting and Economics* 33, 145-171.

Ryan, H., Wiggens, R. (2001), 'The Influence of Firm-Specific Characteristics on the Structure of Executive Compensation', *Journal of Corporate Finance* 7, 101-123.

Sanders, G., Hambrick, D.C. (2007), 'Swinging for the Fences: The Effects of CEO Stock Options on Company Risk-Taking and Performance', *Academy of Management Journal* 50, 1055-1078.

Sharpe, W.F. (1966), Mutual Fund Performance, *Journal of Business* 39, 119-138.

Sharpe, W.F. (1994), The Sharpe Ratio, *The Journal of Portfolio Management* 21, 49-58.

Shleifer, A., Vishny, R. (1997), 'A Survey of Corporate Governance', *The Journal of Finance* 52, 737-775.

Stentoft, L. (2004), 'Assessing the Least Squares Monte Carlo Approach to American Option Valuation', *Review of Derivatives Research* 7, 129-168.

Stulz, R. (1996), 'Retinking Risk Management', *Journal of Applied Corporate Finance* 9, 8-24.

Sundaram, R.K., Yermack, D.L. (2007), 'Pay Me Later: Inside Debt and Its Role in Managerial Compensation', *The Journal of Finance* LXII, 1551-1588.

Tabaksblat, M., Abma, R., Knubben, M., Beuningen, F. van, Glasz, J., Izeboud, G., Kalff, J., Koning, P. de, Möller, G., Pieterse, R., de Vries, P., Westerlaken, A., Winter, J. (2003), 'The Dutch

Corporate Governance Code', *Corporate Governance Committee* Website (http://www.corpgov.nl), amended in 2008 under chairmanship of prof. dr. Jean Frijns.

Tian, Y.S. (2004), 'Too Much of a Good Incentive? The Case of Executive Stock Options', *Journal of Banking and Finance* 28, 1225-1245.

Tosi, H.L., L.R. Gómez-Mejía (1989), 'The Decoupling of CEO Pay and Performance: An Agency Theory Perspective', *Administrative Science Quarterly* 34, pp. 169-189.

Tukey, J. (1977), Exploratory Data Analysis, Addison Wesley, ISBN 0-201-07616-0

Wilcoxon, F. (1945), 'Individual Comparisons by Ranking Methods', *Biometrics* 1, 80-83.

Wright, P., Kroll, M., Krug, J.A., Pettus, M. (2007), 'Influences of Top Management Team Incentives on Firm Risk Taking', *Strategic Management Journal* 28, 81-89.

Yermack, D. (1995), 'Do Corporations Award CEO Stock Options Effectively', *Journal of Financial Economics* 39, 237-269.

Yermack, D. (1996), 'Higher Market Valuation for Firms with a Small Board of Directors', *Journal of Financial Economics* 40, 185-211.

Appendix 3.1: Overview of exchange rate and research variables

Exchange rate used: GPB-EUR: 1.472 (average over the 2001-2008 period).

The table below provides an overview of the research variables, a description, the source and a reference to the section in which the variable is used.

Variable name	Description and source	Section
# of conditions	Dummy variable; 1 if each euro in the long-term incentive plan is governed by 2 or more performance conditions. *Source:* annual reports, current research (fair value calculation).	3.4
# of plans	Number of LTI plans (square transformed). *Source:* annual reports.	3.4
2003	Time dummy 2003	3.5
2004	Time dummy 2004	3.5
2005	Time dummy 2005	3.5
2006	Time dummy 2006	3.5
2007	Time dummy 2007	3.5
2008	Time dummy 2008	3.5
Bank (%)	Percentage of share capital owned by banks. *Source:* annual reports, Manifest.	3.5
Basic salary (€)	Salary including fixed elements, such as vacation allowance and additional end-of-year payments.	3.5
CAPEX	Capital expenditures divided by revenues (expressed as a percentage). *Source:* S&P (CapitalIQ).	3.5
CEO ownership (ln value €)	Share capital owned by the CEO (expressed as a EUR amount). For the regressions, the variable is natural log transformed. *Source:* annual reports, Manifest.	3.5
CEO tenure	Tenure of the CEO in current position (expressed in years). *Source*: annual reports.	3.5
CRI	Compensation risk index.	3.1-3.6
CR_{LTI}	Compensation risk of the long-term incentive plan.	3.1-3.6
CR_{STI}	Compensation risk of the short-term incentive plan.	3.1-3.6
CR_{TDC}	Compensation risk of total direct compensation.	3.1-3.6
Debt-ratio (sqrt)	Debt to total capital ratio (expressed as a percentage). The square root was taken for the regression (sqrtdebtratio). *Source:* S&P (CapitalIQ).	3.5

Variable name	Description and source	Section
Deferred shares	Weight of deferred shares in the total LTI package (expressed as a percentage). *Source:* annual reports, current research (fair value calculations).	3.4
Deloitte	Auditor dummy variable; 1 if the company is audited by the specific company. *Source:* annual reports.	3.5
Employees	The number of employees as per the end of the fiscal year. *Source:* annual reports, S&P (CapitalIQ).	3.3
Ernst & Young	Auditor dummy variable; 1 if the company is audited by the specific company. *Source:* annual reports.	3.5
Exec. Chair	Executive chairman dummy variable; 1 if exec/CEO and chair. *Source:* annual reports, Manifest.	3.5
Exercise period	Remaining exercise period after the moment of vesting (expressed in months). *Source:* annual reports, current research (fair value calculations).	3.4
Individual (%)	Percentage of share capital owned by individuals (personal investments). *Source:* annual reports, Manifest.	3.5
Industrial (%)	Percentage of share capital owned by industrial companies. *Source*: annual reports, Manifest.	3.5
Insurance (%)	Percentage of share capital owned by insurance companies. *Source*: annual reports, Manifest.	3.5
Investment (%)	Percentage of share capital owned by investment funds. *Source:* annual reports, Manifest.	3.5
LTI value (A)	Annualised value of the long-term incentive, calculated based on alternative A. Under alternative A, the input parameters for the calculation are based on 1 year historical data. *Source:* DataStream, Central Bank, annual reports, IFRS2 valuation techniques.	3.5
LTI value (B)	Annualised value of the long-term incentive, calculated based on alternative B. Under alternative A, the input parameters for the calculation are based on the average of 1, 3, 5 and 10 year historical data. *Source:* DataStream, Central Bank, annual reports, IFRS2 valuation techniques.	3.5
Market capitalisation	Total market capitalisation in the research year per 31 December. *Source:* DataStream.	3.3
Market weight	Weight of market condition (such as TSR) in the total LTI package (expressed as a %). *Source:* annual reports, current research (fair	3.4

Variable name	Description and source	Section
	value calculation).	
NED (%)	Percentage of non executive directors in the board (available for one-tier boards). *Source:* annual reports, Manifest.	3.5
New CEO year	Dummy variable; 1 if a new CEO is appointed in the given year. *Source:* annual reports, company websites.	3.5
Nom. Trust (%)	Percentage of share capital owned by nominee/trust. *Source:* annual reports, Manifest.	3.5
Notice	Company notice period of involuntary contract termination (expressed in months). *Source:* annual reports.	3.5
Options	Weight of options in the total LTI package (expressed as a %). *Source:* annual reports, current research (fair value calculations).	3.4
Parachute	Dummy variable; 1 if there is a 'soft landing' measured by the possibility of a higher severance payment than 1 times annual salary. *Source:* annual reports, Manifest.	3.5
Pension (%)	Percentage of share capital owned by pension funds. *Source:* annual reports, Manifest.	3.5
Performance volatility	Volatility of the performance condition. *Source:* annual report, S&P (CapitalIQ), current research (fair value calculations).	3.4
Policy STI value (€)	Target value of the short-term incentive in euro.	3.5
Priceswing	Swinging for the fences' indicator; highest share price in the researched year minus the lowest share price divided by the midpoint. *Source:* DataStream (share prices).	3.5
PWC	Auditor dummy variable; 1 if the company is audited by the specific company. *Source:* annual reports.	3.5
Relative TSR (%)	Relative Total Shareholder Return measured on a yearly basis, by share price movements as well as dividends paid out and reinvested in the stock. Industry average (based on the companies in the sample) is deducted to obtain the relative figure (expressed as a percentage). *Source:* DataStream.	3.5
Revenue	Revenue per the research year (expressed in millions of euro). *Source:* annual reports, S&P(CapitalIQ).	3.3
TDC (A,B)	Total direct compensation, i.e. the sum of basic salary, target value of the short-term incentive plan and the annualised expected value of the long-term incentive plan. Under alternative A, the input parameters for calculation of the value of the LTI are determined	3.5

Variable name	Description and source	Section
	based on 1 year historical data. Under alternative B, the input parameters are based on the average of 1, 3, 5 and 10 year historical data.	
Tobin's Q	Q ratio: book value of debt plus market value of equity divided by book value of total assets. *Source:* annual reports, S&P (CapitalIQ).	3.5
Total assets	Total assets per end of book year expressed in millions of Euro. Natural logarithm of total assets is used for the regressions. of *Source:* annual reports, S&P (CapitalIQ).	3.3, 3.5
Vehicle volatility	Volatility of the underlying vehicle, i.e. zero in the case of cash and equal to share price 'volatility' in case of options and shares. Share price volatility, measured over a 1-year historical period (alternative A) and by taking the average of a period of 1, 3, 5 and 10 years (alternative B). *Source:* DataStream (share prices).	3.4
Vesting period	Weighted vesting period (in months). *Source:* annual reports.	3.4

Appendix 3.2: Comparison of CompRisk$_{TDC}$ (ρ = 1/ρ = 0/ρ = -1)

The tables below, show the impact of STI and LTI correlation on the risk of the total compensation package. Theoretically, these two instruments can be used as a hedge to mitigate payout risk (ρ = -1). The tables show that compensation risk would indeed be relatively low in this scenario. If the structure of the LTI were perfectly (negatively) mimicked by the STI, it would create a perfect hedge, resulting in no risk for the CEO (i.e. CompRisk of 0). This would, for example, involve the grant of put options on the company's stock price. This is not observed in the research sample. It is not in line with the objective of a variable pay contract. It is therefore expected that the correlation coefficient is 0 or positive. Because of the different timing of payout, a correlation of zero is assumed. In addition, the results of the extreme cases of a correlation coefficient of 1 and minus 1 are also shown.

ρ = 1

Statistics	CR TDC 3 A	CR TDC 4 A	CR TDC 5 A	CR TDC 3 B	CR TDC 4 B	CR TDC 5 B
25th percentile	25	28	30	28	31	34
50th percentile	39	41	42	45	46	48
Mean	43	44	46	48	49	50
75th percentile	58	58	59	64	65	65
N	735	575	414	735	575	414

ρ = 0

Statistics	CR TDC 3 A	CR TDC 4 A	CR TDC 5 A	CR TDC 3 B	CR TDC 4 B	CR TDC 5 B
25th percentile	21	22	24	24	26	27
50th percentile	32	33	34	38	39	39
Mean	37	37	38	42	42	43
75th percentile	49	48	49	56	55	55
N	735	575	414	735	575	414

ρ = -1

Statistics	CR TDC 3 A	CR TDC 4 A	CR TDC 5 A	CR TDC 3 B	CR TDC 4 B	CR TDC 5 B
25th percentile	10	10	10	13	13	13
50th percentile	21	21	21	26	26	26
Mean	27	26	27	32	31	32
75th percentile	38	37	39	45	44	45
N	735	575	414	735	575	414

Because the CompRisk tool is particularly used in relative sense (e.g. company X exhibits a higher risk than company Y), the absolute values are less relevant than the relative positioning.

Appendix 3.3: CompRisk comparison UK versus NL – robustness check based on Mann-Whitney test

This table shows the results of the Wilcoxon rank-sum test. Based on the Mann-Whitney two-sample statistic, the null hypothesis is tested that two independent samples (i.e., unmatched data) are from populations with the same distribution. Differences are significant, if the null hypothesis is rejected. Tests are performed for the short-term incentive (based on 3, 4 and 5 year historical data; see section 3.2.2.1), the long-term incentive (based on alternative A and B; see section 3.2.2.2), and total direct compensation (based on basic salary and combinations of the STI and LTI, see section 3.2.2.3).

Null hypothesis	Determination of input	Observations			Mann-Whitney			Relative position	
		NL	UK	Combined	z-stat	Prob > |z|	H_0 Rejected (yes /no)	NL	UK
Short-term incentive									
CompRisk NL = CompRisk UK	3	276	479	755	0.726	0.4678	No	=	=
CompRisk NL = CompRisk UK	4	211	380	591	0.814	0.4158	No	=	=
CompRisk NL = CompRisk UK	5	145	281	426	1.338	0.1808	No	=	=
Long-term incentive									
CompRisk NL = CompRisk UK	A	356	709	1065	4.850	0.0000	Yes	+	-
CompRisk NL = CompRisk UK	B	356	709	1065	5.435	0.0000	Yes	+	-
Total direct compensation									
CompRisk NL = CompRisk UK	UA	479	768	1247	-11.255	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	3VA	479	768	1247	-10.163	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	4VA	479	768	1247	-10.684	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	5VA	479	768	1247	-10.463	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	UB	479	768	1247	-11.187	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	3VB	479	768	1247	-10.166	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	4VB	479	768	1247	-10.657	0.0000	Yes	-	+
CompRisk NL = CompRisk UK	5VB	479	768	1247	-10.353	0.0000	Yes	-	+

Appendix 3.4: Drivers of compensation risk – robustness checks

This table shows the same model as table 3.29, now with robust estimation of standard errors. IRLS stands for iteratively reweighted least squares.

Variable	Huber-White		Bootstrap		Jack-knife		IRLS	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Options	.03305119***	28.14	.03305119***	30.43	.03305119***	28.03	.03195478***	41.25
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Deferred shares	-.01305476***	-10.64	-.01305476***	-12.53	-.01305476***	-10.60	-.01223223***	-13.49
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Vehicle volatility	.09969443***	31.24	.09969443***	32.18	.09969443***	31.08	.10882386***	55.64
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Performance volatility	.01537809***	11.91	.01537809***	12.89	.01537809***	11.87	.00981706***	11.55
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Market weight	.01116261***	10.01	.01116261***	13.31	.01116261***	9.97	.01338316***	19.02
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
# of conditions	-.24956478*	-2.43	-.24956478*	-2.70	-.24956478*	-2.42	-.17580109*	-2.51
	(0.0152)		(0.0069)		(0.0156)		(0.0120)	
# of plans	-.01783035***	-4.74	-.01783035***	-3.87	-.01783035***	-4.69	-.01446476***	-2.97
	(0.0000)		(0.0001)		(0.0000)		(0.0030)	
Vesting period	.16201936***	37.22	.16201936***	42.12	.16201936***	37.04	.16236974***	67.88
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Exercise period	-.0129064***	-5.16	-.0129064***	-4.52	-.0129064***	-5.14	-.01275222***	-5.99
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
_cons	.41208254***	9.99	.41208254***	10.29	.41208254***	9.95	.16237326**	3.01
	(0.0000)		(0.0000)		(0.0000)		(0.0026)	
Observations	2391		2391		2391		2391	
Adjusted R^2	.92266625		.92266625		.92266625		.94797104	

Appendix 3.5: Determinants of the CompRisk index - robustness checks

Panel A: seven alternative $CompRisk_{TDC}$ proxies

The two tables below show the results of the regression for seven alternative ways to calculate the CompRisk index of total direct compensation. It is based on both alternative A and B for the long-term incentive (see section 3.2.2.2). The different $CompRisk_{TDC}$ proxies are furthermore determined by the way short-term incentive compensation risk is calculated: 'U' stands for uniform distribution, '3AV' stands for $CompRisk_{STI}$ calculated based on 3 year historical data, '4AV' is based on 4 year historical data, and '5AV' is based on 5 year historical data. The panel regression takes into account unit fixed effects at the company level. Estimation of standard errors is robust to disturbances being heteroskedastic and autocorrelated (observations are clustered per company). The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01. CompRisk, TDC, CEO ownership, and total assets are natural log transformed. Variables are reflected in the following groups; individual, company, industry, and time effects.

Alternative A for calculation of the long-term incentive

	1		2		3	
Variable	CompRisk - TDC U A		CompRisk - TDC 3AV A		CompRisk - TDC 5AV A	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects						
TDC (A)	.86969508***	11.83	1.0415946***	8.76	.94771677***	10.04
	0.0000		*0.0000*		*0.0000*	
CEO tenure	-.0253744***	-4.93	-.04632808***	-5.00	-.03631754***	-6.18
	0.0000		*0.0000*		*0.0000*	
New CEO year	.04543312	1.11	-.03262158	-0.56	.02010165	0.46
	0.2676		*0.5787*		*0.6480*	
CEO ownership (ln value €)	.00342816	0.66	.00405121	0.51	.00463003	0.75
	0.5071		*0.6117*		*0.4551*	
Company effects						
Nom. Trust (%)	-.00012071	-0.03	.00004741	0.01	.00045362	0.10
	0.9767		*0.9894*		*0.9193*	

Bank (%)	-.00511496	-1.62	-.00732432	-1.48	-.0070825*	-1.82
	0.1079		*0.1396*		*0.0710*	
Insurance (%)	-.00600691	-1.17	-.01273029	-1.45	-.0090328	-1.52
	0.2455		*0.1488*		*0.1294*	
Investment (%)	-.0011097	-0.48	.00065916	0.21	-.00148225	-0.56
	0.6340		*0.8332*		*0.5785*	
Pension (%)	-.00339258	-0.30	-.01603372	-1.10	-.01387952	-1.14
	0.7618		*0.2733*		*0.2566*	
Industrial (%)	-.00970658***	-3.97	-.00980253***	-3.12	-.01094352***	-3.90
	0.0001		*0.0021*		*0.0001*	
Individual (%)	-.00764509	-0.90	-.0051002	-0.33	-.00620954	-0.65
	0.3678		*0.7400*		*0.5171*	
Total assets (ln)	.00214248	0.05	.03248976	0.63	.02146486	0.49
	0.9583		*0.5325*		*0.6271*	
Debt-ratio (sqrt)	.02416073***	2.81	.02829897**	2.39	.02376649**	2.38
	0.0056		*0.0178*		*0.0185*	
CAPEX	-.00178198	-1.02	-.00261697	-1.09	-.00162404	-0.94
	0.3089		*0.2780*		*0.3480*	
Tobin's Q	.07920726***	2.82	.08983526**	2.30	.09511501***	3.00
	0.0054		*0.0229*		*0.0032*	
Priceswing	.02675409	0.39	-.04034169	-0.39	-.01679119	-0.21
	0.6988		*0.6961*		*0.8340*	
PWC	-.21961753*	-1.74	-.50368772**	-2.17	-.35703162**	-2.17
	0.0841		*0.0314*		*0.0316*	
Ernst & Young	-.6285115**	-2.36	-1.0593083*	-1.95	-.74772201*	-1.95
	0.0196		*0.0530*		*0.0524*	
Deloitte	-.04819133	-0.49	-.01783391	-0.10	-.04008786	-0.32
	0.6245		*0.9188*		*0.7513*	
Exec. Chair	.09100455	1.14	.0162115	0.13	.03579337	0.37
	0.2565		*0.8936*		*0.7092*	
NED (%)	.00190742	0.71	.00093302	0.24	.00019755	0.06
	0.4792		*0.8103*		*0.9493*	
Industry effects						
Relative TSR (%)	-.00071357	-1.50	-.00070607	-1.09	-.000844	-1.66

	0.1357		*0.2772*		*0.0981*	
Time effects						
Time dummies (2003-2008)	yes		yes		*yes*	
_cons	-8.6377279***	-8.20	-11.103839***	-6.80	-9.7689131***	-7.44
	0.0000		*0.0000*		*0.0000*	
Observations	1216		1216		1216	
Adjusted R²	.73245759		.64358693		.70614899	

Alternative B for calculation of the long-term incentive

	4		5		6		7	
Variable	CompRisk - TDC U B		CompRisk - TDC 3AV B		CompRisk - TDC 4AV B		CompRisk - TDC 5AV B	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects								
TDC (B)	.8524307***	11.76	1.0176997***	8.70	.92915415***	9.90	.92556263***	10.14
	0.0000		*0.0000*		*0.0000*		*0.0000*	
CEO tenure	-.02468384***	-4.32	-.04477933***	-4.88	-.03761201***	-5.78	-.03483696***	-5.87
	0.0000		*0.0000*		*0.0000*		*0.0000*	
New CEO year	.02521425	0.67	-.04977747	-0.92	-.00049243	-0.01	.00786562	0.20
	0.5037		*0.3602*		*0.9908*		*0.8456*	
CEO ownership (ln value €)	.00155666	0.34	.00065098	0.09	.00189991	0.32	.00198509	0.36
	0.7364		*0.9259*		*0.7470*		*0.7226*	
Company effects								
Nom. Trust (%)	.00167359	0.43	.00163832	0.41	.00136405	0.40	.00212006	0.49
	0.6679		*0.6796*		*0.6922*		*0.6247*	
Bank (%)	-.00411071	-1.53	-.00590287	-1.37	-.00576006*	-1.72	-.00621746	-2.01
	0.1291		*0.1717*		*0.0872*		*0.0458*	
Insurance (%)	-.00590431	-1.32	-.01331283*	-1.66	-.0099225*	-1.97	-.00937132*	-1.84
	0.1890		*0.0981*		*0.0511*		*0.0682*	
Investment (%)	-.0020816	-1.04	-.00003808	-0.01	-.00170479	-0.71	-.00201003	-0.83
	0.3004		*0.9893*		*0.4798*		*0.4063*	
Pension (%)	-.00657577	-0.65	-.02072206	-1.44	-.02308078*	-1.79	-.01830253	-1.61
	0.5140		*0.1519*		*0.0751*		*0.1096*	
Industrial (%)	-.01051351***	-4.90	-.01074342***	-3.86	-.01232882***	-4.63	-.01193672***	-4.86
	0.0000		*0.0002*		*0.0000*		*0.0000*	
Individual (%)	-.00754934	-1.21	-.00434229	-0.32	-.00480242	-0.59	-.00611211	-0.82
	0.2266		*0.7489*		*0.5532*		*0.4115*	
Total assets (ln)	-.00650856	-0.17	.02674186	0.56	.02182537	0.52	.01468644	0.37
	0.8623		*0.5796*		*0.6034*		*0.7124*	
Debt-ratio (sqrt)	.01859737**	2.60	.02246435**	2.07	.0200064**	2.15	.01833098**	2.11
	0.0103		*0.0400*		*0.0333*		*0.0360*	

CAPEX	-.00211009	-1.22	-.00284335	-1.16	-.00196317	-1.11	-.0018844	-1.12
	0.2254		*0.2460*		*0.2667*		*0.2635*	
Tobin's Q	.05392951*	1.95	.06764464*	1.79	.07085158**	2.18	.07171059**	2.30
	0.0534		*0.0759*		*0.0307*		*0.0226*	
Priceswing	-.10550279	-1.61	-.16378377	-1.62	-.13333724	-1.61	-.14103854*	-1.82
	0.1085		*0.1080*		*0.1085*		*0.0711*	
PWC	-.24626784**	-2.10	-.52359913**	-2.43	-.35860172**	-2.41	-.37701118**	-2.55
	0.0369		*0.0163*		*0.0173*		*0.0118*	
Ernst & Young	-.57218857**	-2.01	-1.000192*	-1.79	-.65076284*	-1.66	-.68916046*	-1.75
	0.0465		*0.0751*		*0.0982*		*0.0823*	
Deloitte	-.03020991	-0.29	-.01102948	-0.06	6,56E-03	0.00	-.02456245	-0.20
	0.7731		*0.9494*		*10.000*		*0.8435*	
Exec. Chair	.08984832	1.27	.02448402	0.21	.01968322	0.22	.04058572	0.47
	0.2073		*0.8302*		*0.8261*		*0.6397*	
NED (%)	.00057762	0.24	-.00144975	-0.40	-.00231309	-0.74	-.00201128	-0.69
	0.8068		*0.6914*		*0.4617*		*0.4905*	
Industry effects								
Relative TSR (%)	-.00084498*	-1.71	-.00081798	-1.25	-.00074364	-1.41	-.00092839*	-1.80
	0.0885		*0.2128*		*0.1597*		*0.0737*	
Time effects								
Time dummies (2003-2008)	*yes*		*yes*		*yes*		*yes*	
_cons	-8.1137509***	-7.79	-10.473891***	-6.46	-9.2915886***	-7.09	-9.1690965***	-7.21
	0.0000		*0.0000*		*0.0000*		*0.0000*	
Observations	1216		1216		1216		1216	
Adjusted R²	.77620297		.68208084		.73314122		.74393954	

Panel B: ρ = -1 / ρ = 1

The table below shows the results of the regression for two alternative ways to calculate the CompRisk index of total direct compensation; based on a correlation coefficient of minus 1 and plus 1. It is based on alternative A for the long-term incentive (see section 3.2.2.2) and 4 year historical data for the short-term incentive (3.2.2.1). The panel regression takes into account unit fixed effects at the company level. Estimation of standard errors is robust to disturbances being heteroskedastic and autocorrelated (observations are clustered per company). The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01. CompRisk, TDC, CEO ownership, and total assets are natural log transformed. Variables are reflected in the following groups; individual, company, industry, and time effects.

Variable	CompRisk - TDC 4AV A			CompRisk - TDC 4AV A	
ρ = -1	Coefficient	t-stat	**ρ = 1**	Coefficient	t-stat
Individual effects					
TDC (A)	1.217469***	9.14		.9173684***	9.39
	0.000			*0.000*	
CEO tenure	-.0320387***	-3.12		-.0415043***	-6.08
	0.002			*0.000*	
New CEO year	.075846	0.91		-.0133584	-0.29
	0.363			*0.774*	
CEO ownership (ln value €)	.0020681	0.19		.0047486	0.72
	0.849			*0.470*	
Company effects					
Nom. Trust (%)	-.0001576	-0.02		.0003763	0.11
	0.981			*0.910*	
Bank (%)	-.0110364*	-1.86		-.005636	-1.32
	0.064			*0.190*	
Insurance (%)	-.0181493**	-1.97		-.0088894	-1.44
	0.051			*0.153*	
Investment (%)	-.0022832	-0.45		-.000682	-0.27
	0.656			*0.789*	
Pension (%)	.0114758	0.30		-.0212974	-1.64
	0.764			*0.104*	
Industrial (%)	-.019161***	-2.85		-.0108566***	-3.82
	0.005			*0.000*	
Individual (%)	-.0088349	-0.68		-.004312	-0.40
	0.500			*0.689*	
Total assets (ln)	.0598959	0.52		.0267386	0.62
	0.602			*0.537*	
Debt-ratio (sqrt)	-.0078614	-0.32		.0248009**	2.37
	0.746			*0.019*	
CAPEX	-.000535	-0.18		-.0023835	-1.23
	0.855			*0.221*	
Tobin's Q	.1390783**	2.18		.0828181**	2.48
	0.031			*0.014*	
Priceswing	.0158938	0.11		-.0043794	-0.05
	0.915			*0.958*	

PWC	-.7894688**	-2.62	-.320377*	-1.92
	0.010		*0.057*	
Ernst & Young	-.7893449	-1.40	-.7948724**	-2.00
	0.163		*0.048*	
Deloitte	.217436	0.96	-.0787762	-0.60
	0.340		*0.547*	
Exec. Chair	.0100563	0.06	.0129549	0.13
	0.952		*0.897*	
NED (%)	.0009417	0.15	-.0000319	-0.01
	0.879		*0.992*	
Industry effects				
Relative TSR (%)	-.0032087***	-3.12	-.0002357	-0.43
	0.002		*0.667*	
Time effects				
Time dummies (2003-2008)				
_cons	-14.02274***	-7.33	-9.241712***	-6.82
	0.000		*0.000*	
Observations	1216		1216	
Adjusted R^2	0.4906		0.6970	

Panel C: Cross sectional results

This table shows the results of the regression for the CompRisk index of total direct compensation, based on alternative A for the long-term incentive (see section 3.2.2.2) and based on 4 year historical data for the short-term incentive (see section 3.2.2.1). The cross-sectional regression is based on eight-year average values. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01. CompRisk, TDC, CEO ownership, and total assets are natural log transformed. Variables are reflected in the following groups; individual, company, industry, and time effects.

Variable	CompRisk - TDC 4AV A	
	Coefficient	t-stat
Individual effects		
TDC (A)	.4685093***	6.56
	0.000	
CEO tenure	-.0248236***	-3.28
	0.001	
New CEO year	-.9533352***	-2.64
	0.009	
CEO ownership (ln value €)	.0029185	0.32
	0.748	
Company effects		
Nom. Trust (%)	.0009751	0.49
	0.622	
Bank (%)	.0092992	1.44
	0.152	
Insurance (%)	-.004012	-0.48
	0.632	
Investment (%)	-.0005827	-0.15
	0.879	
Pension (%)	-.0014766	-0.15
	0.883	
Industrial (%)	.0018399	0.36
	0.718	
Individual (%)	.0036582	0.86
	0.389	
Total assets (ln)	-.0328261	-1.10
	0.272	
Debt-ratio (sqrt)	-.0387652*	-1.97
	0.050	
CAPEX	.0159543***	4.71
	0.000	
Tobin's Q	.1098678**	2.27
	0.025	
Priceswing	1.264957***	5.48
	0.000	
PWC	-.1408367*	-1.67
	0.097	
Ernst & Young	-.1679472	-1.56
	0.120	

Deloitte	-.1197328	-1.17
	0.244	
Exec. Chair	.3990756***	2.64
	0.009	
NED (%)	.0012477	0.76
	0.446	
Industry effects		
Relative TSR (%)	-.0170644***	-4.76
	0.000	
_cons	-3.387975	-3.91
	0.000	
Observations	161	
Adjusted R^2	0.6455	

Panel D: UK sample results

This table shows the UK results of the regression for the CompRisk index of total direct compensation (years with no CEO change), based on alternative A for the long-term incentive (see section 3.2.2.2) and the STI based on 4-year historical data (see section 3.2.2.1). The panel regression takes into account unit fixed effects at the company level. Estimation of standard errors is robust to disturbances being heteroskedastic and autocorrelated (observations are clustered per company). The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01. CompRisk, TDC, CEO ownership, and total assets are natural log transformed. Variables are reflected in the following groups; individual, company, industry, and time effects.

Variable	CompRisk - TDC 4AV A	
UK sample	Coefficient	t-stat
Individual effects		
TDC (A)	.8793653***	7.13
	0.000	
CEO tenure	-.0455441***	-4.70
	0.000	
CEO ownership (ln value €)	.0009266	0.11
	0.917	
Company effects		
Nom. Trust (%)	-.0028817	-0.78
	0.438	
Bank (%)	-.0036596	-0.93
	0.356	
Insurance (%)	-.010454	-1.25
	0.215	
Investment (%)	.0004215	0.12
	0.907	
Pension (%)	-.0341865	-0.90
	0.369	
Industrial (%)	-.0067831*	-1.98
	0.051	
Individual (%)	-.0059411	-0.48
	0.629	
Total assets (ln)	.0689534	1.35
	0.181	
Debt-ratio (sqrt)	.0286292**	2.52
	0.013	
CAPEX	.0006526	0.24
	0.810	
Tobin's Q	.096221**	2.49
	0.014	
Priceswing	.0174733	0.14
	0.891	
PWC	-.6107299**	-2.39
	0.019	
Ernst & Young	-1.169794*	-1.93
	0.056	
Deloitte	.1431054	0.54

	0.590	
Exec. Chair	.0294901	0.33
	0.743	
NED (%)	.003011	0.78
	0.435	
Industry effects		
Relative TSR (%)	-.000285	-0.41
	0.685	
Time effects		
Time dummies (2003-2008)	*yes*	
_cons	-9.459893***	-5.31
	0.000	
Observations	657	
Adjusted R^2	0.6501	

Panel E: NL sample results

This table shows the NL results of the regression for the CompRisk index of total direct compensation (years with no CEO change), based on alternative A for the long-term incentive (see section 3.2.2.2) and the STI based on 4-year historical data (see section 3.2.2.1). The panel regression takes into account unit fixed effects at the company level. Estimation of standard errors is robust to disturbances being heteroskedastic and autocorrelated (observations are clustered per company). The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.1; ** p<0.05; *** p<0.01. CompRisk, TDC, CEO ownership, and total assets are natural log transformed. Variables are reflected in the following groups; individual, company, industry, and time effects.

Variable	CompRisk - TDC 4AV A	
NL sample	Coefficient	t-stat
Individual effects		
TDC (A)	1.548639***	4.91
	0.000	
CEO tenure	-.0259541**	-2.59
	0.010	
CEO ownership (ln value €)	.0024912	0.23
	0.822	
Company effects		
Nom. Trust (%)	-.0060126	-1.32
	0.193	
Bank (%)	-.0106741	-1.53
	0.131	
Insurance (%)	-.0114381	-0.86
	0.395	
Investment (%)	-.005898	-1.66
	0.103	
Pension (%)	-.008499	-0.54
	0.590	
Industrial (%)	-.0195743***	-3.37
	0.001	
Individual (%)	-.0108781	-0.54
	0.589	
Total assets (ln)	-.0454041	-0.28
	0.778	
Debt-ratio (sqrt)	.0384351	1.44
	0.154	
CAPEX	-.0137863	-1.59
	0.118	
Tobin's Q	.1607538**	2.42
	0.016	
Priceswing	-.0463323	-0.38
	0.702	
PWC	-.330803	-1.38
	0.171	
Ernst & Young	-.3277725	-1.05
	0.297	
Deloitte	-.0952851	-0.62

	0.541	
Exec. Chair	(dropped)	
NED (%)	.0383964**	2.49
	0.016	
Industry effects		
Relative TSR (%)	-.000527	-0.39
	0.697	
Time effects		
Time dummies (2003-2008)	*yes*	
_cons	-17.02284***	-4.23
	0.000	
Observations	388	
Adjusted R²	0.7190	

Chapter 4

Determinants of Profit Centre Head Remuneration

4.1 Introduction

The objective of this book, is to add to the managerial compensation contracting literature in three ways: i) Open the black box of the executive remuneration decision; ii) Capture the executive remuneration structure in a single quantifiable yardstick; iii) Work with a new and potentially unique dataset on profit centre head remuneration. In this research chapter, I focus on the third approach mentioned. The objective is to research the determinants of profit centre head remuneration.[185]

The remuneration of chief executive officers (CEO) has received ample attention in the academic literature.[186] Despite the fact that the CEO plays a very important role in the organisation, Porter (1980) claims that profit centres are ultimately of key interest in obtaining a competitive advantage, as many strategic decisions are made by the top managers of these profit centres. Therefore, the analysis of compensation for executives below the very top of the corporate hierarchy is important (Lambert, Larcker and Weigelt, 1991). However, hardly any of the academic literature is focused on the topic of compensation of profit centre heads (PCHs).

Table 4.1 provides a first insight into the relative absence of research in this specific area, based on a recent search in the SSRN and JSTOR databases. The general topic of "executive compensation" renders a maximum number of hits in SSRN of 1,431. The more specific topic of "CEO compensation" returns 926 hits. For the JSTOR database these numbers are 125 and 94 respectively. In contrast, various combinations for PCH compensation return a maximum of 3 hits.

---

[185] A profit centre head has profit & loss responsibility for a part of the company. Depending on the structure of the organisation, he is responsible for a geographical area or a line of business / division. Titles that companies use to identify this position are for example: 'managing director', CEO Europe, Executive Vice President, business unit director, area manager, president Americas.
[186] An overview of the literature on the determinants of CEO compensation is provided in appendix 4.5.

Table 4.1: Search results CEO and PCH compensation in JSTOR & SSRN

This table shows the search results in the JSTOR and SSRN databases for various terms related to CEO and PCH compensation. The search engines are not completely the same. SSRN executes the abstract search also in the title and keywords.

Search terms in JSTOR	# HITS IN 'ABSTRACT'	# HITS IN 'TITLE' ONLY
CEO AND compensation	94	36
Chief AND executive AND officer AND compensation	14	3
Executive AND compensation	125	100
Profit AND centre AND head AND compensation	0	0
Profit AND centre AND manager AND compensation	0	0
Profit AND center AND head AND compensation	0	0
Profit AND center AND manager AND compensation	1	1
Business AND unit AND head AND compensation	0	0
Business AND unit AND manager AND compensation	0	2

Search terms in SSRN	# HITS IN 'ABSTRACT'	# HITS IN TITLE ONLY
CEO AND compensation	926	201
Chief AND executive AND officer AND compensation	92	2
Executive AND compensation	1,431	355
Profit AND centre AND head AND compensation	0	0
Profit AND centre AND manager AND compensation	0	0
Profit AND center AND head AND compensation	0	0
Profit AND center AND manager AND compensation	2	0
Business AND unit AND head AND compensation	0	0
Business AND unit AND manager AND compensation	3	0

The almost non-existence of research on profit centre head compensation is likely a result of the limited requirements by corporate governance codes or law, to disclose the compensation information of individual top managers (Ferrarini et al, 2003). For the United States, there is some information, but only in cases where the profit centre head falls within the category of the handful highest paid (proxy) officers.[187] Occasionally U.S. companies are willing to disclose individual remuneration information of all their top managers including the profit centre heads. In conclusion, detailed PCH information below the top executive team for the U.S. is scarce. It is even scarcer for European firms. Because it qualifies as private information, empirical research on this subject is difficult to execute. As several researchers call for exploration of the topic (Bushman, Indjejikian and Smith, 1995; Rajgopal and Srinivasan, 2006), we will provide for such research in this chapter, based on a unique dataset of 645 European firms covering 16,415 CEO / PCH observations over the time span 2000-2008, made available by Towers Perrin.[188]

[187] The Securities and Exchange Commission (SEC) in 2006 adopted disclosure rules which require public companies to disclose the remuneration information for the CEO and its four other most highly paid executive officers (Federal Register / Vol. 71, No. 174 / Friday, September 8, 2006 / Proposed Rules).

[188] If data is reflected, this is done at a high level to respect the proprietary nature.

4.1.1 Research questions

We will base our analysis on three of the major themes in the remuneration literature; traditional agency theory, managerial power theory and corporate tournament theory.

Since Jensen and Meckling (1976), the literature on CEO compensation has been dominated by agency theory. This economic theory based on the principal-agent setting, claims that three problems emerge from the separation of ownership:

1. First, there is a misalignment of interest between managers and shareholders. Shareholders strive for the creation of shareholder wealth through increases in the market value of the firm's common stock, while managers pursue their own career and wealth;
2. Second, managers have more information about the firm than shareholders; this means there is information asymmetry. Because of this asymmetry of information, shareholders are not perfectly able to observe whether managers take the right actions that enhance shareholder value;
3. Third, shareholders are able to hold well-diversified portfolios which make them neutral for firm-specific risk (but not for systemic risk). In contrast, managers are tied to a specific firm with their (human) capital, and exposed to full company risk. This makes them risk-averse.

Because of the misalignment of interests and the different risk preferences, together with the imperfect monitoring by shareholders, agency costs arise. It is a general belief that in order to reduce these agency costs, compensation contracts of managers need to be tied to a performance measure which contributes to the enhancement of long-term shareholder value. In this way, the misalignment of interests between shareholders and managers is reduced.

From this perspective, empirical research has focused on the determinants of CEO pay and particularly the expected relationship between executive compensation and firm performance (among others Agarwal, 1981; Coughlan and Schmidt, 1985; Murphy, 1985; Jensen and Murphy, 1990a; Abowd, 1990; Leonard, 1990). This has not always been an easy task (Hall and Liebman, 1998; Murphy, 1998). This conclusion has added an important dimension to more recent research. Other factors than performance could be important in explaining the executive compensation landscape. An important factor which is suggested by Bebchuk, Fried and Walker (2002) and Grinstein and Hribar (2003), is that managerial power can be of substantial influence. Managerial power theory suggests that the board is not operating at the arm's length ideal. Rather, the CEO may have substantial influence over the board which he uses during the bargaining over executive compensation to influence his pay. It was in these types of studies that personal characteristics and the firm's corporate governance structure gained increased attention (Lewellen et al., 1985; Finkelstein and Hambrick, 1989; Tosi and Gómez-Mejia, 1989;

Yermack, 1996; Cyert, Kang, Kumar and Shah, 1997; Core et al., 1999; Conyon and Murphy, 2000; Murphy, 2002; Bebchuk et al., 2002, 2007).

As mentioned, we will also take into account an alternative stream of research, originated by Lazear and Rosen (1981). They state that, often, positions are filled through promotion from within, and that pay rises strongly with hierarchical level. For subordinates of the CEO, these pay gaps would create the right incentives for eliciting effort and making human capital investments (Bognanno, 2001). This perspective thus has implications for the level and structure of pay for the level(s) below the executive board, but also for the CEO himself. With the absence of the implicit incentives for the CEO, that arise from the opportunities to move up the hierarchical ladder, it is expected that incentives stem more explicitly from the compensation package; i.e. bonuses and LTI plans tied to company performance (Gibbons and Murphy, 1992). Ortín-Ángel and Salas-Fumás (1998) were able to confirm this view; they find that the relative size of the bonus with respect to base salary increases as one moves up the hierarchical ladder.

These discussions have brought us to the following research questions:

Table 4.2: Research questions

This table provides an overview of the research questions of this chapter, the objectives, and the references to the relevant theory focus and section.

Research questions	Objectives	Theory focus	Section
1) What are the determinants of profit centre head remuneration?	We will research the determinants and divide the analysis in two perspectives: i) ex ante perspective: expected compensation in terms of base salary, total target cash compensation, total target direct compensation, pay structure; ii) ex post perspective: actual compensation in terms of bonus, total cash compensation and total direct compensation.	Traditional agency theory	4.3.
2) What are the determinants of the CEO-PCH remuneration gap?	We will research the determinants and divide the analysis in an i) ex ante perspective: base salary, total target cash compensation, total target direct compensation, pay structure; ii) ex post perspective: actual compensation in terms of bonus, total cash compensation and total direct compensation.	Corporate tournament theory	4.4
3) Do CEOs have more power to influence their actual bonus than PCHs?	A proxy for excess remuneration is constructed. We will research: i) Pay-for-performance: is the pay-for-performance adage equally applied to the CEO and the PCHs?; ii) Pay-without-performance: which additional factors can explain CEO bonus payments after controlling for performance?	Managerial power theory	4.5

A limitation to the research is that we do not have performance at the individual profit centre level. We will use performance at the company level combined with the relative size of the profit centre. For ex ante or expected compensation, the absence of performance information at the individual business unit level is less relevant, because here we measure the remuneration level at t=0 (before performance). For the analysis of ex post or realised compensation, we will control for the human capital starting point (ex ante compensation).

4.1.2 Research structure

In the remainder of this chapter we will test the described theories: section 4.2 will provide descriptive statistics of the dataset. In section 4.3 we will address question 1, on the determinants of PCH compensation. Section 4.4 will deal with research question 2 and section 4.5 with research question 3. After some introductory remarks, each of these sections is divided in three subsections: theory & hypothesis development, data & methodology and the results of the analyses. Section 4.6 provides for a general summary and a conclusion.

4.2 Descriptive statistics of the dataset

In this section, we will provide descriptive statistics of the dataset. As the data qualify as proprietary, we will respect the inherent limitations. However, given the unique nature of the sample as well as the academic call for exploration of this topic, we will provide extensive summary statistics.

4.2.1 Companies, industries & countries

The sample consists of 645 of the largest European companies, both listed as well as non-listed. The total number of firm-year-position observations is 16,415. The time span is 2000-2008. The dataset can be qualified as an unbalanced panel, given the fact that data is not always available for each company for each of these years. In tables 4.3 to 4.6 we will provide detailed overviews of the number of observations related to public versus private companies, one-tier versus two-tier governed companies, industry origin and location of the profit centres, on a year-to-year basis.

Table 4.3: Overview public versus private companies

					Year					
Company status	2000	2001	2002	2003	2004	2005	2006	2007	2008	Weighted average
Private %	26	20	23	24	20	21	18	17	18	20
Public %	74	80	77	76	80	79	82	83	82	80
Total observations	617	1000	1523	1902	2184	2358	2289	2146	2396	16415

As 20% of the observations relate to non-listed companies, data collection on specific company parameters for these firms is no sinecure.

Table 4.4: One-tier versus two-tier governance

					Year					
Board governance	2000	2001	2002	2003	2004	2005	2006	2007	2008	Weighted average
One-tier %	84	83	79	78	76	77	75	74	74	77
Two-tier %	16	17	21	22	24	23	25	26	26	23
Total observations	617	1000	1523	1902	2184	2358	2289	2146	2396	16415

Table 4.5: Overview of industries (two-digit SIC)

This table shows which observations are related to which industry, based on two-digit SIC. SIC stands for Standard Industrial Classification.

	Year									
SIC (two-digit)	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
10	8	8	7	10	12	11	18	16	12	102
13	10	21	30	35	48	25	25	16	19	229
14	5	9	12		2	5	8	13	15	69
15	22	35	40	50	45	26	29	23		270
16			21	38	13	30	28	43	38	211
17						2	4	2		8
20	30	55	101	111	138	179	117	89	87	907
21	3	7	8	19	19	20	17	13	5	111
22				5		18	17	17		57
23					2	8	9	2	21	42
25			20	12	20	18	20	15	27	132
26		21	27	11	13	18	7	9	4	110
27	32	41	40	38	61	58	55	52	64	441
28	46	105	97	147	165	166	175	161	172	1234
29	9	10	24	19	25	32	29	26	28	202
30	7	14	18	19	21	25	30	25	27	186
31	6	19						12	2	39
32	17	24	30	33	33	21	21	13	35	227
33	6	15	71	59	57	51	57	51	66	433
34	8	24	29	12	28	28	4	13	6	152
35	9	16	17	35	46	41	36	33	38	271
36	20	39	70	83	76	93	88	79	101	649
37	40	65	116	149	147	147	171	129	71	1035
38	14	25	32	35	21	35	83	74	127	446
39						3	4	6	9	22
40	4		7	20	14	22	6	19	14	106
41				5	5	2	6	6	11	35
42	3	10	14	9	12	12	13	12	11	96
43				8		10	8	9	12	47
44	10	10	14	5	3	3				45
45	22	27	30	38	36	37	51	40	28	309
47	13	19	26	22	12	10	3	3	17	125
48	41	66	67	103	123	140	107	123	108	878
49	32	37	72	104	173	122	132	116	150	938
50	17	21	58	66	68	95	98	99	103	625
51	8	15	7	11	12	33	27	38	35	186
52	4	4	5	5	5	4	5	5		37
53	13	15	24	34	41	49	27	30	26	259
54	7	12	10	26	39	47	39	23	22	225

	Year									
SIC (two-digit)	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
55				2	2	2	2	3	4	15
56			2	2	6	6	17		6	39
57	3	3	3	6	7	18	13	8	8	69
58			5		3	11	7	12	18	56
59	6	8	16	11	14	8	8	5	5	81
60	20	44	114	166	256	256	210	172	246	1484
61	4	2	4	5	8	10	10	22	52	117
62		3	7	12	17	21	33	58	22	173
63	32	61	62	83	106	108	109	72	74	707
64					6		5	10	5	26
65			8	16	17	17	52	47	38	195
67	17	25	24	62	62	63	80	91	91	515
70	24	22	28	22	37	29	26	18	68	274
72				2	2	10	14	19	21	68
73	37	38	47	54	78	120	109	109	141	733
75	2	2		3	3	5	2			17
78				2	3	2	3	2	2	14
79	6	3	2	9	9	7	6	2	18	62
87			57	69	13	19	9	41	66	274
Total	617	1000	1523	1902	2184	2358	2289	2146	2396	16415

Some industries are more prevalent in the dataset than others. There are 3 industries with more than 1,000 observations each: chemicals & allied products (SIC 28), auto, aircraft & ship-building industry (SIC 37), banks (SIC 60). Together, they represent 22.9% of the observations.

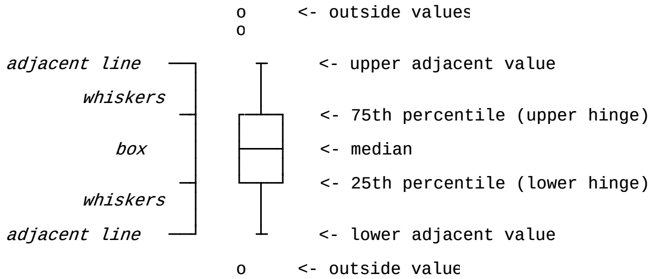
Table 4.6: Country overview (profit centre locations)

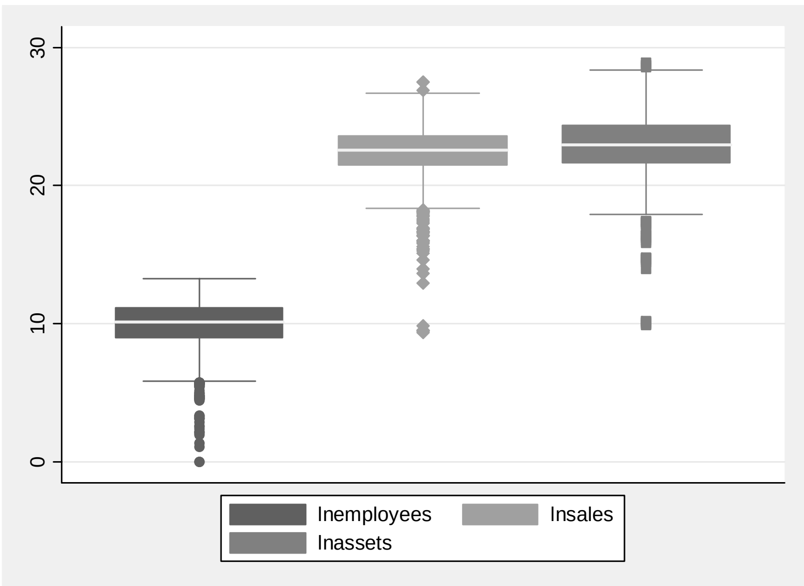
	Year									
Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
AUT						4	113	117	95	329
BEL	31	43	77	111	131	148	118	147	175	981
DEU		26	79	104	151	131	92	123	195	901
ESP			104	168	223	233	226	220	320	1494
FRA	122	271	424	497	555	692	584	453	688	4286
GBR	390	423	532	638	622	596	641	612	575	5029
ITA			1	42	54	61	60	50	64	332
NLD	74	128	167	166	224	279	258	239	210	1745
SWE		109	110	105	116	103	104	103		750
SWZ			29	71	108	111	93	82	74	568
Total	617	1000	1523	1902	2184	2358	2289	2146	2396	16415

In order to provide further insight into the companies in the dataset, we provide summary statistics of scope (employees, total assets, revenue) as well as company age in graph 4.1 and 4.2.

Graph 4.1: Scope (employees, assets sales)

This graph shows vertical box plots of the scope parameters of the companies in the dataset. Reading of the graph box is facilitated by the explanation below. The upper and lower adjacent values are calculated based on Tukey (1977), at 1.5 times the interquartile range. Values outside this cluster, are labelled 'outside values' and plotted separately. All scope figures are natural log transformed.

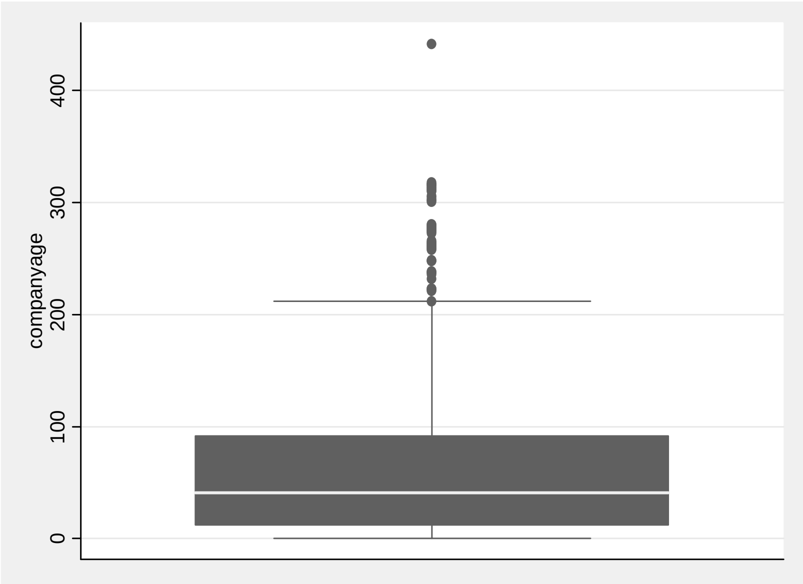




The strength of the (scope) box plot is that it provides an overview of size indicators in a single graph. As the direct interpretation might be less intuitive because of the natural logarithm transformation, we will provide these scope figures again in section 4.2.2 without this transformation. There, we will use these figures to put the compensation figures of CEOs and PCHs in perspective.

Graph 4.2: Overview of company age in years

This graph shows the cross sectional age of the companies in the dataset. Age is expressed in terms of the number of years that have passed since the year of incorporation. For interpretation of the graph box, see graph 4.1.



4.2.2 CEOs and PCHs

In this section we will present summary statistics of CEO and PCH compensation figures, and some personal characteristics. To provide background on the relevant company we will provide scope indicators as well. Table 4.7 provides an overview of the number of CEOs and PCHs per year.

Table 4.7: Overview of CEOs and PCHs

	Year									
Position	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
CEO	140	180	232	296	314	356	338	336	321	2513
PCH - Profit Centre Head	477	820	1291	1606	1870	2002	1951	1810	2075	13902
Total	617	1000	1523	1902	2184	2358	2289	2146	2396	16415

Table 4.7 indicates a total number of 13,902 company-year-PCH observations. The corresponding CEO in various cases was not always part of the remuneration survey on which we have based our analysis. In order to execute CEO-PCH comparability analyses, we have scanned all relevant sources (annual reports, company websites, etc.) in order to fill in the CEO gaps. Due to disclosure constraints throughout Europe, (particularly related to non-listed companies as well as the early years in the sample), this has not always been possible. For

‘easy’ items such as tenure, we succeeded in 89% of the cases. More complex items such as compensation figures were recorded in 80% of the cases. In all of these cases, the CEO earns at least a base salary that could be recorded. Depending on company characteristics (such as being listed or not) this is complemented with a short-term incentive program (STIP) and / or a long-term incentive plan (LTIP). Panel A and B of table 4.8 provide so-called position summary tables for the CEO and PCH position.

Table 4.8: Position summary table – Panel A (CEO position)

This table shows a summary of remuneration figures, personal characteristics and company characteristics for the CEO position, over the research period (2000-2008). For a detailed overview of descriptions and sources of the variables see appendix 4.1. The table makes use of the cross sectional properties of the dataset. In the regression analyses in the upcoming sections we have added a time dummy in order to establish the effects related to time. For summary tables per year, see appendix 4.2. All values are denominated in EUR. All remuneration related percentages, express a percentage of base salary. Used average exchange rates over the period 2000-2008: GBP-EUR: 1.490651, USD-EUR: 0.885573, CHF-EUR: 0.646034, SEK-EUR: 0.109271, JPY-EUR: 0.007758. Source: www.oanda.com.

Chief Executive Officer	N	p5	p25	p50	mean	p75	p95
Base salary	2018	364911	615927	889410	943415	1192384	1714666
Base increase %	1324	0	1	5	7	10	23
STI target value	1603	112764	280000	500000	682925	847173	1917717
STI target %	1603	25	40	50	68	90	130
STI max %	1551	44	65	100	113	150	240
STI value	1786	0	238248	536634	790954	1025918	2570915
STI %	1786	0	35	64	79	106	200
LTI value	1710	0	153507	498580	997279	1133989	3358066
LTI %	1710	0	23	56	92	107	268
Total target variable %	1488	30	75	119	157	188	387
Total variable %	1515	25	70	123	170	213	439
Total Target Cash	2018	464087	825000	1256829	1485898	1866745	3400000
Total Cash	2018	491722	886000	1334732	1659791	2064254	4040576
Total Target Direct Compensation	1710	579190	1158282	1925000	2537745	3016231	6229086
Total Direct Compensation	1710	572424	1162090	1936734	2640015	3187862	6648000
Age of individual	2142	43	50	54	54	58	63
Tenure position (years)	2216	0	1	3	4	6	12
Tenure company (years)	2231	1	4	10	14	22	36
Span of control (# of employees)	2449	1026	8117	23275	47839	66473	171995
Company total employees	2449	1026	8117	23275	47839	66473	171995
Company total assets (* 1 mln)	2391	420	2494	8608	73923	35130	435599
Company total sales (* 1mln)	2380	343	2143	5990	17277	17278	64204
Responsibility (relative size PC)	2513	100	100	100	100	100	100

Table 4.8: Position summary table – Panel B (PCH position)

This table shows a summary of remuneration figures, personal characteristics and company characteristics for the PCH position, over the research period (2000-2008). For a detailed overview of descriptions and source of the variables see appendix 4.1. The table makes use of the cross sectional properties of the dataset. In the regression analyses in the upcoming sections we have added a time dummy in order to establish the effects related to time. For summary tables per year, see appendix 4.3. All values are denominated in EUR. All remuneration related percentages, express a percentage of base salary. Used average exchange rates over the period 2000-2008: GBP-EUR: 1.490651, USD-EUR: 0.885573, CHF-EUR: 0.646034, SEK-EUR: 0.109271, JPY-EUR: 0.007758. Source: www.oanda.com.

Profit Centre Head	N	p5	p25	p50	mean	p75	p95
Base salary	13902	112104	174000	250000	306228	384818	674199
Base increase %	8508	0	3	5	6	8	18
STI target value	12678	23348	51949	95024	156337	185000	469276
STI target %	12678	15	26	40	49	50	100
STI max %	11172	28	44	60	74	90	154
STI value	12280	6711	44237	89177	183699	196964	585323
STI %	12280	4	24	37	51	59	122
LTI value	13192	0	12298	72218	176965	188398	660345
LTI %	13192	0	7	29	48	60	147
Total target variable %	12041	21	44	71	90	112	210
Total variable %	11735	16	41	73	100	121	245
Total Target Cash	13902	138464	226800	339780	448801	551399	1097836
Total Cash	13902	138451	226451	341564	475533	559641	1177307
Total Target Direct Compensation	13192	156591	270000	431453	628919	756970	1691169
Total Direct Compensation	13192	155000	268199	437746	657449	775291	1781372
Age of individual	9862	39	45	49	49	55	60
Tenure position (years)	8492	0	1	2	3	4	9
Tenure company (years)	9517	1	5	13	15	24	34
Span of control (# of employees)	7159	10	264	1380	5704	5000	24180
Company total employees	2449	1026	8117	23275	47839	66473	171995
Company total assets (* 1 mln)	2391	420	2494	8608	73923	35130	435599
Company total sales (* 1mln)	2380	343	2143	5990	17277	17278	64204
Responsibility (relative size PC)	10928	0	2	9	20	25	94

Panel A and B of table 4.8 show apparent differences between the CEO and PCH position. On average the CEO is older than the PCH, earns more in absolute euro terms and has a higher ratio of variable versus fixed compensation, i.e. more explicit performance incentives (see “total variable %” and “total target variable %”).

4.3 Determinants of profit centre head (PCH) remuneration

This section explores the determinants of PCH remuneration. We will first describe the existing theory and develop our hypotheses. Subsequently, we will discuss the data & methodology. Finally, the results of the analyses are presented.

4.3.1 Theory & hypothesis development

When determining the factors that influence the compensation of profit centre heads, it is difficult to rely on existing academic literature, given the limited amount of research available. Fisher and Govindarajan (1992) is an exception to the rule. The determinants of PCH compensation were researched on the basis of a U.S. data set. Given the fact that their data include the years 1982 through 1986, the results from this study might be outdated; furthermore, a U.S. based dataset might not be representative for the European situation. For these reasons we first discuss the factors influencing CEO compensation that are presented in the academic literature. Next, we summarise the results of the Fisher and Govindarajan PCH study to complete the overview. We conclude this section by formulating a hypothesised model of the determinants of PCH compensation.

4.3.1.1 Overview existing literature – determinants of CEO remuneration

This section expounds the determinants of CEO compensation put forth by the empirical and theoretical research in the past. We will classify the determinants into four levels, namely: individual, company, industry, and country level.

<u>Individual effects</u>

Tenure

Several researchers have found a positive relationship between CEO tenure and compensation. Firstly, it is stated that a longer tenure may reflect a higher contribution or ability of the CEO. This could be the case because of the human capital acquirement over time, or because CEOs with better abilities are able to survive longer in this position (Bebchuk, Cremers and Peyer, 2007). Secondly, it is argued that as tenure increases, the CEO is able to build influence within the firm which may increase his political power. The CEO might use this power to tie his compensation package more closely to his own preferences (Finkelstein and Hambrick, 1989; Hill and Phan, 1991; Cyert et al., 1997; Core, Holthausen and Larcker, 1999; Bebchuk et al, 2007).

Age

An increase in age generally results in an increased experience and human capital acquirement, and hence, in a higher level of compensation. However, this increase in compensation shows a concave pattern. After 50-55 years of age, investment in training and human capital accumulation decreases. This may result in a diminishing growth of compensation (Ortín-Ángel and Salas-Fumás, 1998; Conyon and Murphy, 2000).

Externally Hired

When a firm forgoes its internal labour market to hire a CEO from outside the company, it is able to choose from a larger opportunity set of managers and, hence, has a better possibility of matching a manager to the firm. This can be costly when it is assumed that especially general skills are priced, instead of firm-specific skills (Murphy and Zábojník, 2003). Furthermore, outsiders are sometimes already CEO. This implies that they have higher opportunity costs, which requires a higher compensation (Deckop, 1988; Bebchuk, Fried and Walker, 2002). Also, Bebchuk and Fried (2005) state that the outside CEO has strong negotiation power resulting from the hypothesis that directors are willing to give in to higher compensation requests, to prevent a breakdown of the whole negotiation process, which may eventually be more costly.

Education

Observable human capital variables, such as education, serve as a measure of potential productivity when they are taken as proxies of managers' ability and opportunity costs. It is in this light an important determinant of pay. However, the importance of education in setting CEO compensation fades over time, as information about the true productivity comes to notice (Leonard, 1990; Ortín-Ángel and Salas-Fumás, 1998).

Ownership stake

At significant levels of CEO ownership (> 25%), the CEO is likely to be entrenched and is able to control operating decisions as well as board decisions. This means that major stakeholders and the board of directors have less influence over CEO pay. CEOs in this position are in essence able to set their own compensation (Finkelstein and Hambrick, 1989; Tosi and Gómez-Mejia, 1989; Bebchuk et al. 2007).

<u>Company effects</u>

Firm size

Baumol (1959) indicates that executive compensation is closely related to the scale of operations. This is underscored by various others researchers who found that firm size, measured by sales, number of employees, or market capitalisation, is a major determinant of the complexity of the firm. For example, an increased span of control requires better managerial skills from the CEO. This implies that larger firms have a need for better-qualified managers; increased compensation should compensate for these additional requirements (Becker, 1964;

Ciscel, 1974; Agarwal, 1981; Rosen, 1982; Baker et al., 1988; Deckop, 1988.) It is also argued that larger firms have more ability to afford higher fixed cost expenditures than small firms, so they are better able to pay higher wages to CEOs (Balkin and Gómez-Mejia, 1987; Finkelstein and Hambrick, 1989).

Furthermore, Simon (1957) proposed a sociological explanation based on the relationship between company size and management levels. He states that most authority relations within firms are hierarchical structured in a pyramid-form with many management levels. Companies tend to adhere to an appropriate difference in compensation between these levels. This implies that wage differences among CEOs are hence directly related to the number of management levels within the firm. As large firms have more management levels in the hierarchy, CEOs of these firms receive higher compensation than those of small companies.

Firm performance

The basic theory of the firm is based on the view that because of separation of ownership, proper compensation incentives need to be provided to managers in order to elicit shareholder value maximising behaviour. If this theory holds, we should also observe a relation between executive compensation and firm performance, rather than only a relation between executive compensation and firm size, as the latter gives the incentive to managers to only increase the scope of the firm's operations, which is not always in the best interest of the shareholders. There are several researchers that indeed document a strong relationship between CEO compensation and firm performance, such as Lewellen and Huntsman (1970), Hall and Liebman (1998), Kraft and Niederprüm (1999), and Conyon and Schwalbach (2000). Hall and Liebman state that the relationship between CEO compensation and firm performance is for the largest part generated by the changes in value of the CEO's stock and stock options. In Europe, shares and options are a less significant part of total compensation than in the U.S. However, a similar logic applies.

We can conclude that executive compensation is related to both firm size and firm performance (Finkelstein and Hambrick, 1989). Ciscel and Carroll (1980) already indicated that both views are complementary, rather than substitute explanations for the determinants of executive compensation.

Capital structure

Bebchuk et al. (2007) find a relationship between a firm's capital structure and CEO compensation. They suggest that leverage is viewed as costly to the CEO as he might suffer a loss of reputation in the case of default. Hence, the CEO might require more compensation when leverage is high.

Presence of institutional investors

For a dataset of 1,914 firms included in the S&P's ExecuComp database from 1992 through 1997, Hartzell and Starks (2003) find a negative relationship between institutional ownership concentration and the level of executive compensation. They argue that the presence of institutions serves a monitoring role to reduce the agency problem between management and shareholders. Institutional investors reduce the ability of managers to extract rents through compensation. Note that this U.S. practice may not necessarily translate to the European corporate governance context.

Presence of large external shareholder

Related to the previous variable is the presence of large external shareholders. Several researchers provide evidence that the monitoring performed by these large external shareholders reduce the rent extraction by managers (Dyl, 1988; Cyert et al. 1997; Kraft and Niederprüm, 1999). Also, Gómez-Mejia et al. (1987) and Tosi and Gómez-Mejia (1989) determined that the incentives of CEOs and shareholders are better aligned when the company has a 5% external shareholder. When companies lack an outside dominant shareholder, CEOs tend to be rewarded more for performance realised outside of their control.

CEO = Chair

When the CEO is also the chairman of the board of directors, there is said to be CEO duality. Several researchers proved that CEO duality is positively related to CEO compensation. Conyon and Murphy (2000) view the combination of CEO and chairman of the board as a proxy for increased responsibility and ability of the CEO. As was discussed earlier, CEOs are compensated for such additional requirements in the form of increased pay levels. Second, they state that CEO duality is a proxy for the power of the CEO over the board and remuneration committee. When the CEO is also chairman, the extent of board control diminishes, and the CEO is better able to influence his compensation (Boyd, 1994; Core et al., 1999; Cyert, Kang and Kumar, 2002; Bebchuk et al. 2007).

Board size

Yermack (1996) and Core et al. (1999) document a positive relationship between board size and the level of CEO compensation. They state that larger boards might be less effective, which makes it more difficult for large boards to perform effective monitoring. Hence, CEOs may be more able to extract rents in the event of large boards.[189]

---

[189] There are others determinants, such as 'busy board'. When a majority of outside directors serve on three or more boards, the board is viewed as 'busy'. When directors are overstretched, it is argued, they

Industry effects

A number of researchers state that the industry in which a firm operates may have influence on the level of executive compensation (Agarwal, 1981; Balkin and Gómez-Mejia, 1987; Deckop, 1988; Boyd, 1994; Conyon, Peck and Sadler, 2001). According to Hill and Phan (1991) this is because CEO compensation is set with reference to the pay levels of other CEOs in the industry. Furthermore, they argue that CEO compensation is a result of supply and demand for CEOs in an industry.

O'Reilly et al. (1988) found that conglomerates pay their CEOs more than non-conglomerates. Murphy (1998) presented evidence that companies in the financial services industry receive higher compensation than CEOs of companies in non-financial industries.

Country effects

Murphy (1998) provides an international comparison of the pay level and structure of CEO compensation contracts. It was found that U.S. CEOs receive significantly higher compensation than CEOs in other countries. If we compare U.S. CEOs with European CEOs, La Porta, Lopez-de-Silanes and Shleifer (1999), Conyon and Murphy (2000), and Oxelheim and Randøy (2005) find that CEO compensation is higher in Anglo-American firms than in continental European firms.

An overview of the determinants of CEO compensation that are found in the academic literature is provided in appendix 4.5.

4.3.1.2 Overview existing literature – determinants of PCH remuneration

The extensive body of research on CEO compensation contrasts sharply with the absence of papers on the determinants of profit centre head compensation. Fisher and Govindarajan (1992) is an exception to the rule. According to Fisher and Govindarajan (1992), when studying the determinants of profit centre head compensation, we cannot simply transfer the factors that determine CEO compensation to the profit centre level.[190] Therefore, in this section we will discuss their results in detail. Similar to the previous section on CEO compensation, we will

---

may not be effective monitors (Core et al., 1999; Fich and Shivdasani, 2006). Again, diminished monitoring provides the CEO with the possibility to increase his compensation.

[190] First, the maximisation of shareholder value is an important criterion used in previous studies to judge a CEO's performance; however, it is difficult to measure the shareholder value creation at the profit centre level. Second, pay may be a more important motivator for a PCH than for a CEO. Because a typical CEO has more wealth than a typical PCH, a CEO may also be stimulated through other factors like power and prestige. Finally, the process and politics of setting the pay of a PCH and a CEO might differ as the setting of a PCH's pay is normally done within the company while the pay of a CEO is also determined by the board of directors and the shareholders.

classify the determinants into four levels, namely: individual, company, industry, and country effects, and present the sign of the coefficient found by Fisher and Govindarajan (1992).

Individual effects

Job / firm tenure (+)

Fisher and Govindarajan argue that job tenure and firm tenure are potential sources of managerial power. When the job tenure and firm tenure of a PCH increases, the period of time to build up a relationships with the CEO has also increased. These established relationships shape an implicit contract that may allow the PCH to increase his compensation. Furthermore, job tenure and firm tenure may also account for human capital development, due to increased experience. Uniting the arguments on managerial power and human capital development, Fisher and Govindarajan suggest a positive relationship between job tenure and firm tenure and PCH compensation.

Age (+)

Elaborating on the human capital argument, Fisher and Govindarajan state that, typically, experience increases with age. For this reason, increased age translates into an enlarged human capital acquirement. Profit centre heads are compensated for this increased human capital development through means of higher pay.

Education (+)

The relationship between education and PCH compensation is in line with the argument on age. According to Fisher and Govindarajan, increased education should account for increased expertise and, therefore, a higher level of compensation.

Company effects

Firm size / (relative) profit centre size (+)

Although firm size and the level of CEO compensation are significantly related, the effect of firm size on PCH compensation needs not to be the same. Large firms tend to be more complex; however, this complexity is not necessarily transferred to the profit centre level. Profit centres might be designed and compensated as separate pillars; then, firm size would be unrelated to PCH compensation. However, Fisher and Govindarajan find evidence in line with the opinion of Simon (1957). He argued that larger firms have more hierarchical levels, and that most firms tend to create appropriate wage differences between these levels. As profit centres belong to the upper echelons of an organisation, this should imply that the larger the firm, the greater the level of PCH compensation. Together with the greater ability of larger firms to pay higher wages, this leads to the conclusion of Fisher and Govindarajan that firm size is positively related to profit centre head compensation. Next to firm size, the specific size of the profit centre is also related to PCH compensation. Fisher and Govindarajan state that larger profit centres are likely to be more complex than smaller profit centres, and therefore, require better skilled managers. Not only might the absolute size of the profit centre affect the compensation of the PCH, the relative size may also be important. A relatively larger profit centre might have more power because it may contribute relatively more to the firm performance and, hence, is considered to be more important. This power may able a PCH to extract more resources, including compensation. Fisher and Govindarajan find a positive relationship between PCH compensation and profit centre size as well as relative profit centre size.

Firm performance (+)

Fisher and Govindarajan test whether PCH compensation is related to firm performance, as existing academic literature found a correlation between firm performance and CEO compensation. They argue that when firm performance is high, there is a greater ability to pay. In addition, firm performance is determined by profit centre performance. However, the correlation between firm performance and base salary of profit centre heads proved to be insignificant.[191] However they did find a relationship between the bonus component of PCH compensation and firm performance: the better firm performance, the larger the bonus component as a percentage of total cash compensation.

<u>Industry effects</u>

Conglomerates (+)

The study of Fisher and Govindarajan includes controls for industry variations. The results indicate that conglomerates pay higher PCH wages than the other industries included in their sample (only financial services companies tend to pay their PCHs more than conglomerates do). These findings are consistent with the results of O'Reilly et al. (1988) for CEOs. A possible explanation for the fact that conglomerates tend to pay higher PCH wages might be that conglomerates are more complex than firms operating in a homogeneous industry context. This higher level of complexity calls for better skilled profit centre managers, and hence, higher compensation.

---

[191] Firm performance is often measured by a firm's return on equity (ROE). Establishing the ROE of a profit centre is difficult as profit centres do not have easily identifiable asset bases. For this reason, Fisher and Govindarajan were not able to define an objective financial measure of profit centre performance, and hence, do not further deal with issues regarding the relation between profit centre performance and PCH compensation.

Country effects

Fisher and Govindarajan do not deal with country variation as their data sample is solely based on the U.S.

4.3.1.3 Development of hypotheses

We take, as a starting point, the factors of the Fisher and Govindarajan study that have proven to be of influence in determining PCH pay. Table 4.9 provides an overview of these factors.

Table 4.9: Summary determinants of PCH remuneration

This table shows an overview of the variables in the Fisher and Govindarajan (1992) study that have proven to be of influence on PCH remuneration.

Variable	Positive / negative effect
Job/firm tenure	+
Age	+
Education	+
Firm size and (relative) profit centre size	+
Firm performance and (relative) profit centre performance	+
Industry factors: Conglomerates	+

Our model is reflected in equation 4.1 and is an extension of the Fisher and Govindarajan model (taking into account the determinants of CEO compensation), with a few amendments:

i) In comparison to the Fisher and Govindarajan (1992) study, our dataset lacks information on education of the PCH. Education is traded for experience / productivity once individuals have climbed the corporate ladder. Experience is part of the dataset through the variables company tenure, position tenure and age. As we will only study PCHs that are one or two reporting levels away from the CEO position, we believe that the omission of PCH education will not significantly affect our model; ii) In terms of performance variables at the individual profit centre level we have the relative performance contribution, measured by the relative size of the business unit. Due to the fact that we will be (primarily) looking at ex ante (policy) remuneration levels (and control for policy levels in the ex post analyses, and incorporate performance measures at the company level), the absence of other performance measures at the profit centre level will only play a limited role in the results of the model; iii) Changing disclosure requirements over the research period (2000-2008), in different countries, and for listed versus non-listed companies, imposes a difficulty on the collection of block holder information. Therefore, we have used a single source to collect this information (Amadeus/REACH). This ensures consistency and reduces noise in the dataset. The available information provided by this source is for a single moment in time. It is applicable to the end of the research period. We have used this information as a proxy for the other years; iv) As a result of the fact that we research multiple countries, we are able to include additional factors to the model, e.g. to research the impact of one-tier versus two-tier governed companies and country specific practices (Abowd and Bognanno, 1999; Conyon and Schwalbach, 2000; Murphy, 1998; LaPorta et al., 1999; Oxelheim and Randøy, 2005).

$$\textbf{PCH Compensation Level}_{\mathbf{it}} = \alpha + \beta_1 \text{Age}_{it} + \beta_2 \text{DummyExternallyHiredRecently}_{it} + \beta_3 \text{PositionTenure}_{it} + \beta_4 \text{CompanyTenure}_{it} + \beta_5 \text{ReportingLevel}_{it} + \beta_6 \text{InternationalScope}_{it} + \beta_7 \text{SpanofControl}_{it} + \beta_8 \text{PCRelativeSize}_{it} + \beta_9 \text{FirmSize}_{it} + \beta_{10} \text{CompanyAge}_{it} + \beta_{11} \text{IPOAge} + \beta_{12} \text{Governance(DummyTwo-tierBoard)}_{it} + \beta_{13} \text{CapitalExpenditures\%ofSales}_{it} + \beta_{14} \text{FirmPerformance}_{it} + \beta_{15} \text{FirmRisk}_{it} + \beta_{16} \text{BlockHolderTotal\%}_{i} + \beta_{17} \text{BlockHolderType\%}_{i} + \beta_{18} \text{DummyFinancialCompany}_{it} + \beta_{19} \text{DiversificationLevel(Conglomerate)}_{it} + \beta_{20} \text{DummyCountry}_{it} + \beta_{21} \text{DummyTime}_{i} + \varepsilon_{it} \quad \textbf{[4.1]}$$

4.3.2 Data & methodology

As was reflected in table 4.6, there are 13,902 PCH-firm-year observations. As aforementioned, the disclosure requirements in Europe (especially in the early part of the sample and for non-listed companies) are limited. This implies that not in all cases we have been able to collect the right-hand-side variables. Furthermore, survey right-hand-side variables (such as tenure and relative PC size) were not always recorded for each case. In combination this can cause a “butterfly effect”. The trade-off is clear. Including more variables in the dataset creates a decreasing number of total observations. In line with Greene (2003) we will follow the zero-order method of replacing each missing value, with the sample regressor average for all variables that are not dummies. This results in no changes and is equivalent to dropping the incomplete data. The benefit of this approach is that it is not necessary to delete the whole observation line. However, there is no free lunch. The approach has the disadvantage of resulting in a lower R^2. With regard to dummy variables from the survey, we have recorded a one if we are certain that the relevant variable is applicable. For example, for the dummy variable “externally hired” we have recorded a one in those cases were we have the information that the person is indeed externally hired and zero in all other cases. The same is true for the category variable ‘international scope’. This is defended, based on the experience that if the characteristic is not relevant, it is not (always) filled in.

Our objective is to research both time variant and invariant determinants of PCH remuneration. In terms of the regression methodology, we have therefore used pooled OLS. In order to account for the fact that multiple observations are related to the same company, as well as the possibility that residuals can behave non-independent within companies, we will cluster the observations per company. This results in standard errors being robust to disturbances being heteroskedastic and autocorrelated. To take into account time, country and industry effects, we have used dummy variables. Pearson correlation coefficients are below 0.4[192] and the mean VIF equals 2.00.

4.3.3 Results of the analyses

We have split this section in an ex ante and ex post perspective. Ex ante refers to the policy remuneration levels (base salary, target STI, annualised expected long-term incentive value as well as the sum of total target cash and total target direct compensation). Typically, the policy remuneration level rewards for the built-up human capital. Ex post refers to the actual earned bonus levels (i.e. actual STI, actual total cash, and total direct compensation). We would expect these levels to be tied to performance after controlling for the target remuneration level.[193]

4.3.3.1 Ex ante perspective

Table 4.10 and 4.11 present the results of the analyses. Table 4.10 reflects (natural logarithm transformed) remuneration levels in euro and table 4.11 reflects individual policy elements of the pay structure expressed as a percentage of base salary.

---

[192] In two instances, the correlation coefficient is higher than 0.4: i) the correlation coefficient between company assets (ln) and company employees equals 0.428; ii) the correlation coefficient between gearing and the dummy for companies in the financial services industry equals 0.5379.

[193] Long -term incentives are typically directly tied to company performance (e.g. share price within listed firms) and therefore typically satisfy the pay-for-performance adage (apart from the discussion on rewarding for luck, among others Bertrand and Mullanaithan, 2001).

Table 4.10: PCH compensation – policy pay levels

This table shows the results of the regression for the ex ante or policy compensation levels, following equation 4.1. In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used four dependent variables: i) 'Base salary' equals all fixed components including elements such as vacation allowance; ii) 'Base increase' equals the increase in base salary in the research year; iii) 'TTC' is total target cash, which equals the sum of base salary and target cash bonus; iv) 'TTDC' is total target direct compensation (TTDC) which equals the sum of base salary, target cash bonus and the annualised long-term incentive value. Remuneration figures are expressed in EUR and are natural log transformed. Base salary increase is expressed as a percentage. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.05; ** p<0.01; *** p<0.001. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed.

Variable	Base salary (ln)		Base increase (%)		TTC (ln)		TTDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects (job & personal characteristics)								
Age	0.011113 ***	11.33	-0.081543 ***	-4.37	0.010228 ***	9.43	0.009289 ***	7.26
	0.0000		*0.0000*		*0.0000*		*0.0000*	
Dummy externally hired recently	0.044323 *	2.29	-1.125734 ***	-3.49	0.026882	1.09	0.009081	0.32
	0.0224		*0.0005*		*0.2757*		*0.7496*	
Position tenure	-0.000816	-0.40	-0.130879 ***	-3.81	-0.002520	-0.92	0.000700	0.21
	0.6899		*0.0002*		*0.3565*		*0.8343*	
Company tenure	-0.002989 ***	-3.78	0.025137	1.80	-0.003827 ***	-4.36	-0.004201 ***	-3.91
	0.0002		*0.0721*		*0.0000*		*0.0001*	
Reporting level	-0.393750 ***	-24.24	-0.940118 ***	-4.19	-0.456029 ***	-25.11	-0.501844 ***	-22.14
	0.0000		*0.0000*		*0.0000*		*0.0000*	
International scope	0.070719 ***	10.88	-0.032387	-0.35	0.097437 ***	11.52	0.116995 ***	11.63

Variable	Base salary (ln)		Base increase (%)		TTC (ln)		TTDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0000		*0.7262*		*0.0000*		*0.0000*	
Span of control	0.000004 ***	5.15	0.000001	0.10	0.000004 ***	4.81	0.000004 ***	3.95
	0.0000		*0.9242*		*0.0000*		*0.0001*	
PC relative size	0.002885 ***	9.25	0.005730	1.42	0.002996 ***	8.16	0.003945 ***	8.42
	0.0000		*0.1573*		*0.0000*		*0.0000*	
Company effects (size, age, capital, performance, risk, governance, block holders)								
Company assets (ln)	0.082253 ***	11.19	0.009027	0.09	0.093914 ***	9.52	0.117288 ***	8.95
	0.0000		*0.9298*		*0.0000*		*0.0000*	
Company employees	0.000001 ***	3.31	0.000003	1.10	0.000001 **	3.23	0.000001 *	2.29
	0.0010		*0.2717*		*0.0013*		*0.0225*	
Company age	-0.000121	-0.79	0.007157 **	2.81	-0.000173	-0.88	-0.000185	-0.77
	0.4301		*0.0051*		*0.3788*		*0.4424*	
IPO age	0.011093 **	2.66	-0.012781	-0.28	0.013849 **	2.78	0.017308 *	2.57
	0.0079		*0.7777*		*0.0056*		*0.0104*	
Governance (dummy two-tier board)	-0.075812 **	-2.65	-0.187082	-0.58	-0.093855 *	-2.36	-0.118693	-1.91
	0.0082		*0.5629*		*0.0184*		*0.0564*	
Liquidity ratio	-0.000024	-0.90	-0.000599 *	-2.24	-0.000038	-1.28	-0.000042	-1.60
	0.3705		*0.0258*		*0.2025*		*0.1109*	
Gearing	-0.000001	-0.18	-0.000112 **	-2.89	0.000000	0.06	0.000000	0.04
	0.8546		*0.0040*		*0.9513*		*0.9672*	
Capital expenditure% of sales	0.000049	0.58	0.001406	1.49	-0.000043	-0.47	-0.000034	-0.28

Variable	Base salary (ln)		Base increase (%)		TTC (ln)		TTDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.5637		*0.1374*		*0.6352*		*0.7834*	
ROCE	0.000630	1.50	0.010778	1.61	0.000270	0.56	0.001339	1.90
	0.1349		*0.1083*		*0.5748*		*0.0574*	
Profit margin	-0.000485	-1.61	0.009670	1.90	-0.000334	-0.87	-0.000312	-0.82
	0.1087		*0.0583*		*0.3864*		*0.4110*	
Interest coverage	0.000068 ***	10.08	0.000060	0.56	0.000080 ***	8.17	0.000085 ***	5.58
	0.0000		*0.5744*		*0.0000*		*0.0000*	
Volatility	0.000274	1.53	0.003613 ***	3.64	0.000267	0.89	0.000193	0.66
	0.1274		*0.0003*		*0.3723*		*0.5125*	
Tobin's Q (market-to-book)	0.000153	0.48	-0.001446	-0.46	-0.000121	-0.27	-0.000257	-0.48
	0.6292		*0.6441*		*0.7882*		*0.6291*	
Block holders total %	-0.000775	-1.42	0.000832	0.13	-0.001992 **	-2.98	-0.002746 ***	-3.32
	0.1563		*0.8973*		*0.0030*		*0.0009*	
Block holder % (insurance company)	0.001399 *	2.40	0.011459	0.79	0.003486 **	3.16	0.004754 **	2.93
	0.0165		*0.4317*		*0.0016*		*0.0035*	
Block holder % (bank)	0.000253	0.40	-0.011830	-1.48	0.000696	0.69	0.001514	1.50
	0.6870		*0.1384*		*0.4885*		*0.1342*	
Block holder % (industrial company)	0.001022 *	2.20	-0.001801	-0.29	0.001434 *	2.36	0.001328	1.65
	0.0281		*0.7683*		*0.0186*		*0.0993*	
Block holder % (nominee/trust)	-0.002586	-1.53	-0.009118	-0.57	-0.001596	-0.69	-0.000904	-0.39
	0.1258		*0.5663*		*0.4912*		*0.6961*	
Block holder % (financial company)	0.000346	0.43	-0.006993	-0.67	0.001417	1.50	0.001802	1.71

Variable	Base salary (ln)		Base increase (%)		TTC (ln)		TTDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.6639		*0.5013*		*0.1346*		*0.0874*	
Block holder % (individual / family)	0.000824	0.60	-0.024966	-0.88	-0.000089	-0.06	0.000125	0.06
	0.5465		*0.3809*		*0.9521*		*0.9486*	
Block holder % (foundation)	-0.000454	-0.39	0.024552	1.63	0.000200	0.13	0.000944	0.55
	0.6938		*0.1032*		*0.8928*		*0.5837*	
Block holder % (emp./ man. /directors)	-0.060862 **	-3.11	-0.250677	-1.58	-0.079781 ***	-4.36	-0.079407 *	-2.43
	0.0020		*0.1148*		*0.0000*		*0.0155*	
Block holder % (private equity)	0.003167	1.42	-0.016732	-1.49	0.003292	1.27	0.002516	0.74
	0.1573		*0.1376*		*0.2046*		*0.4575*	
Block holder % (state)	-0.000515	-0.61	-0.000505	-0.05	-0.000558	-0.56	-0.002366	-1.55
	0.5435		*0.9571*		*0.5787*		*0.1206*	
Industry effects								
Dummy financial company	-0.031864	-0.78	0.123075	0.26	-0.010442	-0.19	-0.030050	-0.42
	0.4376		*0.7977*		*0.8500*		*0.6739*	
Diversification level (conglomerate)	0.014459	0.98	-0.133498	-0.69	0.022831	1.34	0.038865	1.68
	0.3291		*0.4878*		*0.1807*		*0.0938*	
Country effects								
Country dummy (Austria)	-0.345570 **	-3.05	0.255187	0.24	-0.339808 **	-2.71	-0.500632 **	-3.07
	0.0024		*0.8084*		*0.0069*		*0.0022*	
Country dummy (Belgium)	-0.104297 *	-2.05	-0.333771	-0.64	-0.152591 *	-2.20	-0.255945 **	-2.65

Variable	Base salary (ln)		Base increase (%)		TTC (ln)		TTDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0411		*0.5212*		*0.0281*		*0.0082*	
Country dummy (France)	-0.187566 ***	-4.59	0.519860	1.23	-0.264288 ***	-5.29	-0.199501 **	-2.76
	0.0000		*0.2188*		*0.0000*		*0.0059*	
Country dummy (Germany)	-0.255267 ***	-5.01	1.223831	1.30	-0.153051 **	-2.60	-0.162359 *	-2.45
	0.0000		*0.1938*		*0.0094*		*0.0144*	
Country dummy (Italy)	-0.009691	-0.15	1.441692	1.23	-0.049996	-0.61	-0.071288	-0.68
	0.8806		*0.2186*		*0.5439*		*0.4999*	
Country dummy (Spain)	-0.171233 **	-3.03	2.651469 **	2.74	-0.085249	-1.25	-0.177995 *	-2.03
	0.0025		*0.0063*		*0.2109*		*0.0429*	
Country dummy (Sweden)	-0.508155 ***	-9.04	0.515000	0.90	-0.659556 ***	-9.90	-0.827638 ***	-8.92
	0.0000		*0.3662*		*0.0000*		*0.0000*	
Country dummy (Switzerland)	-0.490870 ***	-8.38	-0.141513	-0.23	-0.515873 ***	-6.24	-0.430924 ***	-4.08
	0.0000		*0.8212*		*0.0000*		*0.0001*	
Country dummy (UK)	0.366163 ***	8.92	1.494448 ***	3.31	0.353875 ***	6.86	0.378601 ***	5.19
	0.0000		*0.0010*		*0.0000*		*0.0000*	
Time effects								
Time dummies (2001-2008)	yes		yes		yes		yes	
_cons	11.804834 ***	106.60	14.156680 ***	8.49	12.129100 ***	86.91	12.381563 ***	68.42
	0.0000		*0.0000*		*0.0000*		*0.0000*	

Variable	Base salary (ln)		Base increase (%)		TTC (ln)		TTDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Observations	13902		8508		13902		13192	
Adjusted R^2	0.6278		0.0555		0.5984		0.5667	

Observations related to table 4.10:

Individual effects

As we would expect, the age of the position holder is a positive determinant of base salary as well as the other (total) compensation definitions.

Externally hired individuals are able to negotiate a higher base salary. However, once in the position they are much less likely to get a (strong) base salary raise. This could imply that during the time of hiring, the company is willing to pay immediately at the higher end of the salary range, determined for the specific position, to get the person willing to transfer. It is typical that insiders follow a growth path over the first years in the position. The longer the individual is in the same position, the smaller the salary increase (as shown in table 4.10 by a negative correlation between base increase and position tenure as well as with age). It is likely that this 'final level' for the insider in absolute terms is lower than for (recent) external hires.

Company loyalty seems to be not rewarded, given the fact that there is a negative and significant correlation between company tenure and the absolute level of pay (all definitions). This is in line with Murphy and Zabojnik (2007), who explore the hypothesis that general skills are more priced than firm specific skills.

We observe expected correlations for reporting level (PCHs that are further away from the CEO, earn less than their counterparts reporting directly to the CEO), international scope (greater scope increases complexity and therefore pay), span of control (increase of job complexity and pay), relative size of the profit centre (increase of job complexity and pay).

Company effects

An increase in company size, in terms of assets and employees, is correlated with higher pay.

The presence of block holders, as measured by the total percentage of stock owned by block holders, has a disciplining effect on total pay, expressed by negative correlations with target total cash and target total direct compensation. Some individual differences for the type of block holders are picked up by the model as well. The governance of the company also affects the level of compensation. Two-tier governed companies pay less in terms of total cash compensation (after controlling for size and county differences), than one-tier companies. At the 10% significance level this conclusion also holds for total direct compensation.

Some other observations: i) Companies that are longer listed, pay more than non listed companies and recently listed companies; ii) The level of interest coverage is positively related to pay.

Industry effects

The industry dummy to pick up financial companies here is not significant. This implies that in terms of total policy remuneration levels, the financial industry seems to be no different than the general industry. However, we will see important differences in the way variable pay is geared (short versus long-term) in the discussion regarding table 4.11.

Country effects

There are country differences in comparison to the Dutch practices, especially notable for the UK (higher pay) and for Sweden and Switzerland (lower pay).

Time effects

The time dummies are positive and significant. In relation to the year 2000, pay has increased each year, stabilising in the year 2007 and showing a decrease in 2008 (returning more or less to the regressor value in 2005). The start of the financial crisis could be a possible explanation for this.

Based on the same right-hand-side variables, table 4.11 further zooms in on the variable pay elements and the mix between these elements

Table 4.11: PCH compensation – pay structure / mix

This table shows the results of the regression for the ex ante or policy compensation structure, following equation 4.1. It focuses on the various aspects of variable pay as a percentage of fixed remuneration. In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used five dependent variables: i) 'STI target %' equals the policy short term incentive level, paid out if targets are met (instead of underperformed or exceeded) as a percentage of base salary; ii) 'STI max %' equals the policy short-term incentive level, paid out in case of defined 'maximum performance', expressed as percentage of base salary; iii) 'LTI%' equals the total annualised value of all long-term incentive components (including e.g. stock options with and without condition, restricted shares and performance shares), expressed as a percentage of base salary; iv) 'STI target & LTI%' equals the total target variable pay as a percentage of base salary; v) 'ST versus LT ratio' is the STI policy target percentage divided by the LTI percentage. If the ratio is higher than 1, the company has a greater short-term focus through its incentive pay. It can therefore also be translated a proxy of short-term focus. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.05; ** p<0.01; *** p<0.001. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed.

Variable	STI target %		STI max %		LTI %		STI target & LTI %		ST versus LT ratio	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects (job & personal characteristics)										
Age	-0.254420 *	-2.25	-0.369879 *	-2.01	-0.253586	-1.73	-0.452687 *	-2.40	-0.006049	-0.94
	0.0249		*0.0451*		*0.0837*		*0.0168*		*0.3458*	
Dummy externally hired recently	-1.688035	-0.94	-7.101804 **	-2.89	5.004333	0.59	-5.290940	-1.16	0.046573	0.35
	0.3478		*0.0040*		*0.5538*		*0.2456*		*0.7262*	
Position tenure	0.117232	0.72	-0.371066	-1.38	0.604405	1.51	0.537886	1.17	-0.030731 **	-2.74
	0.4706		*0.1678*		*0.1308*		*0.2441*		*0.0064*	
Company tenure	-0.142346 **	-2.70	-0.244960 **	-2.75	-0.165659	-1.25	-0.336265 *	-2.46	-0.005145	-1.25
	0.0071		*0.0062*		*0.2113*		*0.0142*		*0.2110*	
Reporting level	-9.227246 ***	-7.09	-16.282408 ***	-7.79	-18.583484 ***	-4.64	-24.410528 ***	-8.68	0.229245 **	2.66

Variable	STI target %		STI max %		LTI %		STI target & LTI %		ST versus LT ratio	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0000		*0.0000*		*0.0000*		*0.0000*		*0.0080*	
International scope	4.148602 ***	4.84	6.865336 ***	4.24	5.943617 ***	4.80	9.446242 ***	7.05	0.018832	0.36
	0.0000		*0.0000*		*0.0000*		*0.0000*		*0.7220*	
Span of control	0.000118	1.70	0.000146	1.29	0.000416	1.66	0.000432	1.71	-0.000001	-0.16
	0.0893		*0.1961*		*0.0969*		*0.0878*		*0.8722*	
PC relative size	0.031664	1.21	0.031818	0.89	0.171130 **	2.67	0.236554 ***	3.78	0.001132	0.35
	0.2261		*0.3752*		*0.0077*		*0.0002*		*0.7267*	
Company effects (size, age, capital, performance, risk, governance, block holders)										
Company assets (ln)	2.648971 ***	3.50	4.390659 **	3.28	5.132556 **	3.00	6.709353 ***	4.03	-0.062516	-1.12
	0.0005		*0.0011*		*0.0028*		*0.0001*		*0.2616*	
Company employees	0.000017	1.09	0.000029	1.18	-0.000007	-0.14	0.000070	1.64	-0.000001	-0.52
	0.2761		*0.2384*		*0.8883*		*0.1007*		*0.6055*	
Company age	0.002885	0.12	0.003472	0.09	0.029504	0.42	-0.024985	-0.62	0.000528	0.40
	0.9075		*0.9295*		*0.6776*		*0.5346*		*0.6888*	
IPO age	0.631458	1.78	1.030547	1.41	0.624947	0.81	1.397490	1.56	0.056059 *	1.98
	0.0763		*0.1599*		*0.4179*		*0.1190*		*0.0487*	
Governance (dummy two-tier board)	-4.561278	-1.40	-14.957237 *	-2.15	-12.332279	-1.20	-9.595947	-0.97	-0.341560 *	-2.32
	0.1618		*0.0323*		*0.2314*		*0.3331*		*0.0210*	
Liquidity ratio	-0.000620	-0.25	-0.003210	-0.82	0.003606	0.44	-0.006634	-1.49	-0.000078	-0.41
	0.8018		*0.4097*		*0.6609*		*0.1370*		*0.6795*	
Gearing	0.000330	1.31	0.000181	0.40	0.000314	0.50	0.000406	0.60	0.000026	1.31

Variable	STI target %		STI max %		LTI %		STI target & LTI %		ST versus LT ratio	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.1918		*0.6881*		*0.6201*		*0.5455*		*0.1907*	
Capital expenditure% of sales	-0.013958	-1.24	-0.009930	-0.54	0.000763	0.03	0.023903	0.77	-0.001115 *	-2.11
	0.2150		*0.5862*		*0.9759*		*0.4434*		*0.0351*	
ROCE	-0.008337	-0.20	0.077045	1.11	0.337120 *	2.02	0.155338	1.26	-0.004599 *	-2.21
	0.8384		*0.2659*		*0.0439*		*0.2095*		*0.0276*	
Profit margin	0.012999	0.28	-0.055053	-0.85	0.074262	0.86	0.027661	0.30	-0.001056	-0.54
	0.7812		*0.3971*		*0.3916*		*0.7655*		*0.5881*	
Interest coverage	0.001742 *	2.57	0.000317	0.27	0.001385	0.45	0.001762	0.79	-0.000023	-0.35
	0.0105		*0.7882*		*0.6549*		*0.4318*		*0.7246*	
Volatility	-0.002667	-0.20	0.002597	0.10	0.007220	0.21	-0.021394	-0.96	0.000929	0.75
	0.8444		*0.9219*		*0.8305*		*0.3352*		*0.4515*	
Tobin's Q (market-to-book)	-0.049598	-1.55	-0.079208	-1.30	0.003276	0.06	-0.097013 *	-2.00	-0.000480	-0.33
	0.1205		*0.1948*		*0.9528*		*0.0464*		*0.7397*	
Block holders total %	-0.211675 **	-3.16	-0.332694 **	-2.83	-0.355819 *	-2.21	-0.468351 ***	-3.60	-0.003358	-0.86
	0.0017		*0.0048*		*0.0276*		*0.0003*		*0.3917*	
Block holder % (insurance company)	0.377152	1.71	-0.002613	-0.01	0.630389 *	2.30	0.987437 *	2.23	-0.004348	-1.27
	0.0874		*0.9890*		*0.0215*		*0.0264*		*0.2043*	
Block holder % (bank)	0.095744	1.71	0.264940	1.87	0.288439	1.56	0.354821 *	2.14	-0.001514	-0.36
	0.0882		*0.0614*		*0.1202*		*0.0328*		*0.7206*	
Block holder % (industrial company)	0.101440 *	2.01	0.157760	1.68	0.103282	0.98	0.128418	1.34	0.001648	0.56
	0.0446		*0.0934*		*0.3278*		*0.1818*		*0.5782*	
Block holder % (nominee/trust)	0.307419	1.78	0.405306	1.81	1.291148	0.78	-0.119456	-0.40	0.031972	1.62

Variable	STI target %		STI max %		LTI %		STI target & LTI %		ST versus LT ratio	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0750		*0.0707*		*0.4383*		*0.6876*		*0.1068*	
Block holder % (financial company)	0.241434 **	3.19	0.309280	1.69	0.201936	1.46	0.362285 *	2.47	-0.000184	-0.05
	0.0015		*0.0913*		*0.1443*		*0.0138*		*0.9615*	
Block holder % (individual / family)	-0.033651	-0.32	0.035828	0.15	0.322254	1.06	0.026928	0.11	0.001515	0.22
	0.7515		*0.8814*		*0.2903*		*0.9161*		*0.8271*	
Block holder % (foundation)	0.165895	0.95	0.260654	0.74	0.116875	0.48	0.159528	0.53	0.005791	0.41
	0.3429		*0.4605*		*0.6316*		*0.5983*		*0.6814*	
Block holder % (emp./ man. /directors)	-2.852576 *	-2.42	-5.380053 *	-2.15	-0.370997	-0.12	-7.491502 **	-2.94	0.099022	1.86
	0.0157		*0.0321*		*0.9030*		*0.0034*		*0.0638*	
Block holder % (private equity)	0.023875	0.43	0.021575	0.19	-0.212399	-1.28	-0.177430	-1.05	0.009733	1.26
	0.6643		*0.8479*		*0.2011*		*0.2935*		*0.2082*	
Block holder % (state)	-0.016066	-0.25	-0.102244	-0.88	-0.203599	-1.12	-0.248239	-1.52	0.000184	0.02
	0.8049		*0.3778*		*0.2638*		*0.1293*		*0.9833*	
Industry effects										
Dummy financial company	12.614861 *	2.44	28.091006 **	2.67	-6.767992	-0.97	2.671702	0.28	0.586020 *	2.48
	0.0150		*0.0079*		*0.3300*		*0.7788*		*0.0135*	
Diversification level (conglomerate)	1.389754	1.02	5.485355 **	2.67	1.364266	0.31	1.926553	0.43	-0.102579	-1.01
	0.3080		*0.0077*		*0.7569*		*0.6649*		*0.3114*	
Country effects										
Country dummy (Austria)	0.762414	0.09	6.072780	0.30	-28.952899 *	-2.55	-21.033981	-1.49	0.423138	1.01

Variable	STI target %		STI max %		LTI %		STI target & LTI %		ST versus LT ratio	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.9315		*0.7660*		*0.0109*		*0.1363*		*0.3108*	
Country dummy (Belgium)	-5.283062	-0.88	-8.372606	-0.65	-26.259471 *	-2.11	-28.888153 *	-2.03	0.451557	1.31
	0.3810		*0.5150*		*0.0356*		*0.0433*		*0.1893*	
Country dummy (France)	-7.337041 *	-2.10	-22.850182 **	-3.02	13.056023	1.07	-1.373215	-0.11	-0.529821 *	-2.36
	0.0363		*0.0026*		*0.2865*		*0.9139*		*0.0187*	
Country dummy (Germany)	21.092007 ***	5.28	36.053810 ***	3.46	0.117446	0.01	19.741784 *	2.29	0.138036	0.43
	0.0000		*0.0006*		*0.9904*		*0.0226*		*0.6680*	
Country dummy (Italy)	-6.149576	-1.03	-25.079242 *	-2.26	-5.679883	-0.41	-5.853562	-0.36	-0.222679	-0.50
	0.3021		*0.0244*		*0.6808*		*0.7159*		*0.6174*	
Country dummy (Spain)	14.056615	1.73	-1.017354	-0.07	-23.789386	-1.69	-1.384022	-0.09	0.278103	0.70
	0.0835		*0.9450*		*0.0922*		*0.9284*		*0.4857*	
Country dummy (Sweden)	-18.116275 ***	-4.10	-25.716368 **	-2.71	-38.515943 **	-3.20	-49.576260 ***	-3.72	0.540607	1.03
	0.0000		*0.0069*		*0.0014*		*0.0002*		*0.3025*	
Country dummy (Switzerland)	1.837202	0.44	15.408144	1.43	18.677608	0.94	19.139451	0.92	-0.240937	-0.50
	0.6604		*0.1530*		*0.3472*		*0.3601*		*0.6146*	
Country dummy (UK)	0.006878	0.00	2.539375	0.34	-3.051365	-0.27	-0.859574	-0.07	-0.361290	-1.56
	0.9984		*0.7364*		*0.7898*		*0.9429*		*0.1196*	
Time effects										
Time dummies (2001-2008)	yes		yes		yes		yes		yes	
_cons	38.309962 ***	4.08	64.265325 ***	3.32	65.987509 *	2.23	113.528690 ***	3.99	1.786104 **	2.73

Variable	STI target %		STI max %		LTI %		STI target & LTI %		ST versus LT ratio	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0001		*0.0010*		*0.0258*		*0.0001*		*0.0066*	
Observations	12678		11172		13192		12041		9413	
Adjusted R²	0.220772		0.246041		0.056993		0.1793065		0.07428318	

Table 4.11 shows that the pay structure model has a lower R^2 than the pay level model (see table 4.10). We have the following observations:

Individual effects

Short-term variable pay decreases with age. This might be a response of companies to overcome the horizon problem. A similar observation can be made for the variable ‘Position tenure’. Being longer in the position has a negative correlation with a priori short-term focused incentives (ST versus LT ratio).

We also observe that a PCH that is closer to the CEO, in terms of his reporting level (direct report instead of indirect report), earns a higher level of variable pay.

Furthermore, international scope is positively related to more variable pay. An explanation for this may be that a job with international responsibility comes with exposure to a more competitive international labour market. Following the international norm rather than the local benchmark can be a necessary hedge against easy transfer of its employees to a different employer.

Company effects

Company size is positively related to the use of incentives. Larger companies have greater means to set up, sometimes administrative burdensome, variable pay programs, due to economies of scale.

Companies with greater capital expenditures seem to be less short-term focused, as reflected by the negative correlation with the proxy for short-term focus (‘ST versus LT ratio’). This may be caused by the fact that the impact of investments is especially revealed over a longer period of time, which forces the company to also be more long-term focused in terms of remuneration.

Companies with a higher Tobin’s Q are associated with overall lower total variable pay as a percentage of base salary. At the 95% confidence level, this shows that better company performance is not necessarily correlated with a greater amount of incentives. As stated by Jensen and Murphy (2010), “It is not how much you pay, but how.” This implies that the underlying structure of remuneration matters, as researched in chapter 3 of this book, where we did find a positive correlation between remuneration structure, as measured by the CompRisk index, and Tobin’s Q.

The total percentage of block holders, results in a disciplining effect on variable pay under all definitions; i.e. a significantly negative b-coefficient.

Industry effects

The financial services sector is significantly correlated to a short-term focus in terms of variable pay. We will discuss this issue further in: "A note on the financial services sector" at the end of these (initial) conclusions. Other industry effects are found at conglomerates, which tend to set higher maximum STI policy levels.

Country effects

Germany is well known for its high bonus levels. Indeed, we observe significantly (at the 99.9% confidence level) higher bonuses. Approximately 21%-points higher than the Netherlands in terms of target STI and 36%-points higher in terms of maximum STI. In Germany, cash pay-outs are more tax efficient and therefore more observed. For Sweden we observe overall lower levels of variable compensation, both STI and LTI. This might be the result of its culture, promoting more equality. In terms of the short-term versus long-term focus we only observe a (negative) significant estimator for France. Indeed, France is well known for its higher levels of long-term compensation in comparison to short-term compensation. This is also emphasised by the negative correlation with 'STI target %' and 'STI max%'. Fiscal motives are important drivers of this (long-term share compensation is tax efficient in France).

Time effects

Short-term variable compensation as a percentage of fixed compensation has increased over the years. Approximately 17%-points for 2008, in relation to 2000, for the target STI. For the maximum STI level the increase amounts to 32%-points. From CEO research we know that LTI levels have increased as well over this period. We do not observe this at the PCH level, over the research period. This may be caused by a desire to assess performance close to the sphere of influence of the position. Long-term incentives are typically equity based. PCHs have less influence on the share price than CEOs.

A note on the financial services sector

Following the financial crisis, the financial services sector has been scrutinised, late 2008 and continuing in 2009 and 2010. There were accusations of taking excessive risk and being myopic. The question whether pay packages in the preceding years have contributed to this has been a question of debate. A call for reform of pay practices was made by various corporate governance bodies as well as regulators and financial market authorities.[194] In table 4.10 we have seen that financial services companies do not tend to pay more than general industry companies. However table 4.11 shows that the manner in which pay is structured, does differ from the general industry. Short-term variable pay is significantly higher than in the other industries (target as well as maximum). Furthermore the proxy for 'short-term focus' is positively correlated to the financial services sector dummy.

4.3.3.2 Ex post perspective

Now that we have discussed the remuneration policy in terms of the total level and the relationship between fixed and variable pay, we will focus on the actual (bonus) outcome. How much is actually earned by the PCH and where does this relate to?

Table 4.12 shows two panels (A and B). On top of the variables of panel A, panel B includes the remuneration target value (ex ante remuneration) as one of the explanatory variables. This is taken into account through adding the target STI level in the actual STI regression, the level of base salary plus target STI in the TC regression and the level of base salary plus target STI plus expected LTI value in the TDC regression. Panel B thus controls for the 'human capital starting point'. The panels in conjunction allow for stronger conclusions on the various individual, company, industry and country effects.

Table 4.12: Actual remuneration levels – panel A

This table shows the results of the regression for the ex post or realised compensation levels, following equation 4.1. In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used three dependent variables: i) 'Actual STI value' which equals the paid out bonus; ii) 'TC' is total cash which equals base salary plus actual bonus; iii) total direct compensation (TDC) which equals base salary plus actual cash bonus plus the annualised value of long-term incentives. Remuneration figures are expressed in EUR and are natural log transformed. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Variables are reflected in the following groups: individual, company, industry, and country

[194] Nederlandse Vereniging van Banken (NVB) "Banking Code", September 2009; Financial Services Authority (FSA) "Reforming remuneration practices in financial services", August, 2009; Financial Stability Board "Principles for Sound Compensation Practices – Implementation Standards", September 2009; International Institute of Finance (IIF) "Final report of the committee on market best practices: Principles of conduct and best practice recommendations", July 2008; Community of European Banking Supervisors (CEBS) "High-level principles of Remuneration Policies", April 2009.

effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed.

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects (job & personal characteristics)						
Age	0.00917***	4.10	0.010414***	9.52	0.009714***	7.41
	0.00000		*0.000000*		*0.000000*	
Dummy externally hired recently	-0.06538	-1.31	-0.018577	-0.78	-0.028859	-1.00
	0.1910		*0.4374*		*0.3153*	
Position tenure	0.01502***	3.41	0.009550***	3.68	0.009957**	2.82
	0.0007		*0.0003*		*0.0049*	
Company tenure	-0.00629***	-3.98	-0.003861***	-4.40	-0.004345***	-4.01
	0.0001		*0.0000*		*0.0001*	
Reporting level	-0.63211***	-19.54	-0.458040***	-23.59	-0.500387***	-21.22
	0.0000		*0.0000*		*0.0000*	
International scope	0.14448***	9.19	0.096171***	11.75	0.116908***	11.66
	0.0000		*0.0000*		*0.0000*	
Span of control	0.00000**	2.86	0.000004***	4.90	0.000004***	3.72
	0.0044		*0.0000*		*0.0002*	
PC relative size	0.00348***	4.95	0.002788***	7.07	0.003824***	7.66
	0.0000		*0.0000*		*0.0000*	
Company effects (size, age, capital, performance, risk, governance, block holders)						
Company assets (ln)	0.18441***	9.41	0.110191***	10.29	0.129305***	9.55
	0.0000		*0.0000*		*0.0000*	
Company employees	0.00000	1.37	0.000001*	2.53	0.000001*	2.13
	0.1697		*0.0117*		*0.0337*	
Company age	0.00024	0.69	0.000089	0.44	-0.000039	-0.16
	0.4890		*0.6588*		*0.8759*	
IPO age	0.02057*	2.09	0.014701**	2.89	0.018591**	2.76
	0.0366		*0.0040*		*0.0060*	
Governance (dummy two-tier board)	-0.22878*	-2.30	-0.129180**	-3.15	-0.141423*	-2.29
	0.0220		*0.0017*		*0.0221*	
Liquidity ratio	-0.00001	-0.15	-0.000023	-0.65	-0.000032	-1.09
	0.8819		*0.5167*		*0.2777*	
Gearing	0.00001	1.05	0.000002	0.48	0.000002	0.30
	0.2947		*0.6291*		*0.7635*	
Capital expenditure% of sales	-0.00005	-0.25	0.000031	0.34	0.000039	0.31
	0.8055		*0.7314*		*0.7573*	

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
ROCE	0.00627***	4.23	0.001904***	3.46	0.002586***	3.36
	0.0000		*0.0006*		*0.0008*	
Profit margin	-0.00037	-0.43	-0.000413	-0.93	-0.000385	-0.85
	0.6659		*0.3517*		*0.3974*	
Interest coverage	0.00009***	5.37	0.000084***	8.85	0.000106***	6.85
	0.0000		*0.0000*		*0.0000*	
Volatility	0.00017	0.58	0.000281	1.23	0.000192	0.83
	0.5619		*0.2178*		*0.4093*	
Tobin's Q (market-to-book)	0.00055	0.93	0.000434	1.06	0.000289	0.54
	0.3541		*0.2915*		*0.5884*	
Block holders total %	-0.00505***	-4.02	-0.002527***	-3.95	-0.003122***	-3.70
	0.0001		*0.0001*		*0.0002*	
Block holder % (insurance company)	0.00299	1.06	0.002540**	3.17	0.004175**	3.18
	0.2885		*0.0016*		*0.0015*	
Block holder % (bank)	0.00286*	2.13	0.001371	1.83	0.001991	1.92
	0.0339		*0.0671*		*0.0557*	
Block holder % (industrial company)	0.00252	1.94	0.002123***	3.41	0.001939*	2.36
	0.0533		*0.0007*		*0.0184*	
Block holder % (nominee/trust)	0.00155	0.33	-0.000221	-0.12	-0.000508	-0.17
	0.7442		*0.9061*		*0.8685*	
Block holder % (financial company)	0.00622***	3.84	0.002377*	2.43	0.002412*	2.22
	0.0001		*0.0155*		*0.0265*	
Block holder % (individual / family)	0.00219	0.74	0.002749	1.82	0.002402	1.21
	0.4583		*0.0688*		*0.2265*	
Block holder % (foundation)	-0.00116	-0.58	0.000159	0.14	0.000430	0.30
	0.5606		*0.8890*		*0.7673*	
Block holder % (emp./ man. /directors)	-0.05941	-1.40	-0.058066*	-2.00	-0.066379	-1.69
	0.1612		*0.0460*		*0.0913*	
Block holder % (private equity)	-0.00053	-0.14	0.002823	1.27	0.002149	0.66
	0.8860		*0.2055*		*0.5118*	
Block holder % (state)	-0.00177	-1.03	0.000450	0.44	-0.001363	-0.91
	0.3039		*0.6606*		*0.3644*	
Industry effects						
Dummy financial company	0.17435	1.56	0.069132	1.18	0.032979	0.45
	0.1192		*0.2376*		*0.6503*	
Diversification level (conglomerate)	0.05149	1.63	0.025972	1.51	0.042963	1.82
	0.1030		*0.1317*		*0.0697*	

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Country effects						
Country dummy (Austria)	-0.48217*	-2.06	-0.410854*	-2.55	-0.549469**	-2.91
	0.0400		*0.0110*		*0.0037*	
Country dummy (Belgium)	-0.24333	-1.85	-0.148177*	-2.22	-0.244506**	-2.72
	0.0655		*0.0270*		*0.0067*	
Country dummy (France)	-0.38615***	-3.77	-0.224130***	-4.77	-0.177769**	-2.60
	0.0002		*0.0000*		*0.0096*	
Country dummy (Germany)	0.19357*	2.15	-0.217072**	-3.23	-0.215972**	-2.86
	0.0320		*0.0013*		*0.0044*	
Country dummy (Italy)	-0.33736	-1.75	-0.113333	-1.32	-0.125498	-1.15
	0.0799		*0.1863*		*0.2501*	
Country dummy (Spain)	-0.09377	-0.70	-0.110049	-1.65	-0.191088*	-2.21
	0.4841		*0.0990*		*0.0275*	
Country dummy (Sweden)	-0.99234***	-6.99	-0.622596***	-9.35	-0.788477***	-8.78
	0.0000		*0.0000*		*0.0000*	
Country dummy (Switzerland)	-0.45600**	-2.83	-0.481011***	-6.43	-0.428046***	-3.98
	0.0048		*0.0000*		*0.0001*	
Country dummy (UK)	0.42281***	4.09	0.351282***	6.97	0.380168***	5.40
	0.0000		*0.0000*		*0.0000*	
Time effects						
Time dummies (2001-2008)	yes		yes		yes	
_cons	10.1889***	37.07	11.9320***	81.37	12.2001***	66.27
	0.0000		*0.0000*		*0.0000*	
Observations	11761		13902		13192	
Adjusted R²	0.501164		0.578277		0.558675	

Table 4.12: Actual remuneration levels – panel B

This table shows the results of the regression for the ex post or realised compensation levels, following equation 4.1. In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used three dependent variables: i) 'Actual STI value' which equals the paid out bonus; ii) 'TC' is total cash which equals base salary plus actual bonus; iii) total direct compensation (TDC) which equals base salary plus actual cash bonus plus the annualised value of long-term incentives. Remuneration figures are expressed in EUR and are natural log transformed. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.05; ** p<0.01; *** p<0.001. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed. In addition to panel A, the ex ante remuneration levels are incorporated as right-hand-side variables: i) 'STI target value' equals the expected or target bonus amount paid out if targets are met (instead of underperformed or exceeded); ii) 'Base salary' equals all fixed components including elements such as vacation allowance; iii) 'LTI value' equals the annualised value of all long-term incentive components (including e.g. stock options with and without condition, restricted shares and performance shares). These three elements are expressed in EUR and are natural log transformed.

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects (contract, job & personal characteristics)						
STI target value (ln)	0.869918***	38.55	0.216281***	11.38	0.172022***	8.95
	0.000		*0.000*		*0.000*	
Base salary (ln)			0.811721***	31.07	0.620043***	24.06
			0.0000		*0.0000*	
LTI value (ln)					0.236257***	21.42
					0.0000	
Age	0.000592	0.44	-0.000587	-1.35	-0.001176**	-2.68
	0.659700		*0.176000*		*0.007600*	
Dummy externally hired recently	-0.020484	-0.59	-0.048619***	-4.54	-0.014143	-1.23
	0.5558		*0.0000*		*0.2199*	
Position tenure	0.012426**	3.19	0.008995***	6.53	0.007486***	6.66
	0.0015		*0.0000*		*0.0000*	
Company tenure	0.000159	0.16	0.000215	0.61	-0.000050	-0.14
	0.8707		*0.5414*		*0.8904*	
Reporting level	-0.081634***	-3.60	-0.003112	-0.39	-0.006609	-0.79
	0.0003		*0.6993*		*0.4302*	
International scope	0.024967**	2.85	0.009582**	3.15	0.009506**	2.88
	0.0046		*0.0017*		*0.0042*	
Span of control	-0.000001	-1.30	0.000000	-0.78	0.000000	-0.29
	0.1953		*0.4376*		*0.7711*	
PC relative size	0.000457	1.17	-0.000361*	-2.21	-0.000211	-1.20
	0.2442		*0.0275*		*0.2309*	
Company effects (size, age, capital, performance, risk, governance, block holders)						
Company assets (ln)	0.057477***	5.15	0.009819*	2.17	0.004647	1.13
	0.0000		*0.0302*		*0.2597*	
Company employees	0.000000	-0.23	0.000000	-1.35	0.000000	-0.61
	0.8195		*0.1778*		*0.5442*	

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Company age	0.000342	1.79	0.000041	0.38	-0.000041	-0.49
	0.0746		*0.7015*		*0.6274*	
IPO age	0.003264	0.65	0.000654	0.33	0.001927	0.94
	0.5174		*0.7400*		*0.3470*	
Governance (dummy two-tier board)	-0.050255	-0.98	-0.019245	-0.90	-0.019739	-1.04
	0.3271		*0.3694*		*0.3005*	
Liquidity ratio	-0.000001	-0.02	-0.000002	-0.10	-0.000041	-1.35
	0.9826		*0.9207*		*0.1784*	
Gearing	0.000005	1.20	0.000002	1.09	0.000001	0.93
	0.2293		*0.2754*		*0.3530*	
Capital expenditure% of sales	0.000279	1.84	0.000067	0.94	0.000102	1.91
	0.0668		*0.3457*		*0.0562*	
ROCE	0.005255***	4.07	0.001102**	2.99	0.000854*	2.42
	0.0001		*0.0029*		*0.0159*	
Profit margin	0.000399	0.62	0.000249	1.05	0.000267	1.56
	0.5364		*0.2955*		*0.1195*	
Interest coverage	0.000022*	2.48	0.000001	0.31	0.000001	0.27
	0.0135		*0.7566*		*0.7911*	
Volatility	0.000164	1.06	0.000045	0.84	0.000094	1.92
	0.2879		*0.4012*		*0.0548*	
Tobin's Q (market-to-book)	-0.000149	-0.49	-0.000030	-0.21	0.000011	0.10
	0.6275		*0.8358*		*0.9237*	
Block holders total %	-0.002364*	-2.58	-0.001059***	-4.16	-0.001014***	-4.08
	0.0100		*0.0000*		*0.0001*	
Block holder % (insurance company)	-0.002180*	-2.25	-0.000066	-0.21	0.000324	0.90
	0.0248		*0.8327*		*0.3666*	
Block holder % (bank)	0.001953*	2.09	0.000588	1.91	0.000608*	2.38
	0.0369		*0.0565*		*0.0175*	
Block holder % (industrial company)	0.001795*	2.35	0.000876***	3.75	0.000696**	3.09
	0.0190		*0.0002*		*0.0021*	
Block holder % (nominee/trust)	-0.004560	-0.94	0.000503	0.47	0.001124	1.54
	0.3488		*0.6357*		*0.1253*	
Block holder % (financial company)	0.002025*	2.01	0.000739	1.88	0.000266	0.77
	0.0444		*0.0611*		*0.4433*	
Block holder % (individual / family)	0.000294	0.13	0.001717*	2.51	0.001777*	2.22
	0.8950		*0.0125*		*0.0271*	
Block holder % (foundation)	-0.000104	-0.07	0.000552	0.88	0.000411	0.36
	0.9438		*0.3772*		*0.7163*	

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Block holder % (empl./ man. /directors)	0.004711	0.51	0.010289*	2.26	0.020829***	4.28
	0.6107		*0.0239*		*0.0000*	
Block holder % (private equity)	-0.002509	-1.45	-0.000183	-0.31	-0.000322	-0.54
	0.1488		*0.7559*		*0.5919*	
Block holder % (state)	0.001492	1.68	0.001513***	3.92	0.001709**	2.92
	0.0944		*0.0001*		*0.0037*	
Industry effects						
Dummy financial company	0.016240	0.35	0.057775**	2.90	0.050770**	2.84
	0.7296		*0.0038*		*0.0046*	
Diversification level (conglomerate)	0.000507	0.03	0.005131	0.93	-0.004671	-0.63
	0.9748		*0.3516*		*0.5276*	
Country effects						
Country dummy (Austria)	-0.018843	-0.28	-0.016439	-0.39	0.001832	0.04
	0.7790		*0.6979*		*0.9670*	
Country dummy (Belgium)	-0.016484	-0.23	-0.004809	-0.18	-0.004059	-0.15
	0.8212		*0.8558*		*0.8829*	
Country dummy (France)	-0.082167	-1.47	0.006555	0.31	0.017501	0.82
	0.1425		*0.7551*		*0.4154*	
Country dummy (Germany)	0.048246	0.85	-0.066752	-1.56	-0.090419*	-2.19
	0.3972		*0.1200*		*0.0289*	
Country dummy (Italy)	-0.085843	-0.98	-0.045915	-1.20	-0.031394	-0.83
	0.3277		*0.2288*		*0.4073*	
Country dummy (Spain)	-0.024670	-0.34	0.057100	1.93	0.012544	0.48
	0.7339		*0.0540*		*0.6287*	
Country dummy (Sweden)	-0.068622	-0.72	0.030309	0.94	0.059299	1.64
	0.4726		*0.3462*		*0.1008*	
Country dummy (Switzerland)	-0.189917	-1.61	-0.041721	-1.19	0.016075	0.35
	0.1075		*0.2364*		*0.7292*	
Country dummy (UK)	0.116573	1.90	-0.021096	-0.95	-0.034715	-1.57
	0.0577		*0.3437*		*0.1177*	
Time effects						
Time dummies (2001-2008)	yes		yes		yes	
_cons	0.965050**	3.31	0.079671	0.50	0.696980***	4.55
	0.0010		*0.6179*		*0.0000*	

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Observations	10725		12533		9339	
Adjusted R^2	0.752613		0.910300		0.942587	

The general conclusion, related to table 4.12, is that panel B is a more efficient model. It has a significantly higher R^2, (e.g. moving from 58% to 91% for TC), and thus adds significant explanation to the model. Furthermore, a single variable, i.e. ex ante remuneration, replaces explanation of multiple variables such as: country effects, governance model, company tenure, time effects. This renders a model with fewer variables, because the latter variables can be taken out of the model. Actual pay is thus explained by target pay (human capital starting point). In addition, panel B reflects the other variables that are relevant, and we will discuss the significant ones below.

Individual effects

In terms of influencing actual pay-outs, table 4.12B shows that there is a negative correlation between being externally hired (recently) and total cash compensation. This may be related to negotiation power. At the moment of hire, the candidate has the possibility to influence his ex-ante compensation. Table 4.10 showed that external hires receive a higher base salary. However, we also saw that once in the firm, the likelihood of getting a strong base salary increase is lower. The fact that the negotiation power drops once in the firm is also emphasised by table 4.12. There is a negative correlation with the actual received total cash compensation. The negotiation power needs to be built up by position tenure. Indeed, we see a positive and significant correlation between actual pay (all definitions) and years in position.

In addition, we observe positive correlations with actual pay and international scope of the position. PCHs with international scope responsibility might be more important for the company than PCHs with local responsibility only, which results in more power to negotiate a higher actual compensation.

Company effects

There is a positive correlation between company size as measured by (ln) assets. It could be that larger firms are less efficient in establishing the real performance of the PCH. Paying out below target level requires a stronger business case towards the individual than paying at or above target. This could create an upward bias in larger firms, also because the “price of inefficiency” in such companies is less directly observed; the larger the company is, the lower the top management compensation costs as fraction of total cash flows. We also observe positive correlations with the level of ROCE and interest coverage. There is a negative correlation with the total percentage of block owners. Certain type of block holders are associated with higher actual compensation levels. This might be the result of an explicit believe in pay-for-performance.

Industry effects

There is a tendency in the financial sector that variable pay is more guaranteed. The financial services dummy is positively and significantly correlated with total cash and total direct compensation. This is an effect that goes beyond the identified performance and personal characteristics. It could be the result of hedging human capital risk; i.e. the risk that potentially strong performers for the future, will leave the company if the variable element of the remuneration package would not be paid out.

Country effects

There are no specific country effects other than Germany at the total direct compensation level. In relation to the Netherlands, and the other countries, there is some evidence that the Germans are more strict in establishing the actual total direct compensation level (negative correlation). Country effects are incorporated in the ex ante remuneration level, that has been added to the model as a control variable. In comparison, Panel A, in which the ex ante remuneration level is not incorporated, does show significant country effects for all of the countries in the dataset (except for Italy).

Time effects

The only effects related to time that we observe, are 2007 and 2008. These years seem to be the peak in terms of actual pay-outs. Given the start of the financial crisis late 2008 this has caused a debate on the effectiveness of variable pay. Do strong incentives mitigate the agency problem, or are they part of the problem, stimulating managers to “swing for the fences”.

A note on the relevance of performance I

Although we do not have specific details on performance at the individual profit centre level, in panel B, we were still able to explain between 75% (STI actual pay-out) and 91% (total cash pay-out) of the variation in the dataset. The lion share is explained by the underlying policy levels. Therefore it seems that current performance is not the most important factor in explaining the variation in actual observed STI levels. It is one of many other factors, including past performance, expected future performance, managerial power etc. In section 4.5 we will further elaborate on pay-for-performance, pay-for-power and ‘pay-for-x’.

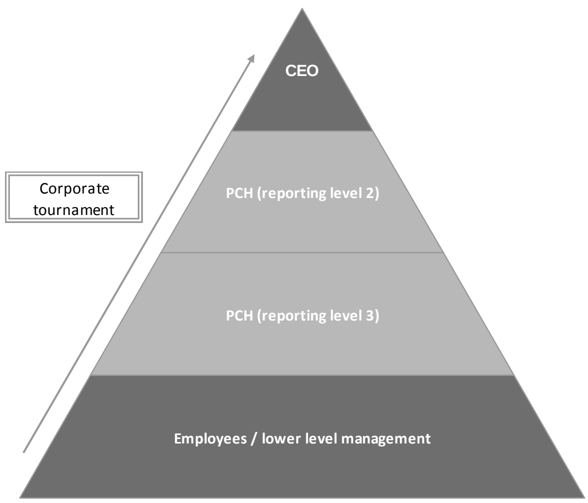
4.4 Corporate tournaments and the CEO-PCH remuneration gap

Besides the determinants of profit centre head remuneration in isolation, an additional research topic relates to the question how the level of PCH compensation compares to the level of compensation of the CEO. A real-life example of ABN AMRO (2006) shows that internal pay relativity matters, among others, because it can be used as a reason to increase CEO pay. At the annual shareholders' meeting, Aarnout Loudon, chairman of the supervisory board, proposed to increase the maximum bonus of the board of management from 125% of basic salary to 200% of basic salary, partially based on the fact that executives below board level could earn larger bonuses than board of management members (Financieele Dagblad, 28 April 2006). The compensation relations between the upper echelons in an organisation are often approached by means of the tournament theory, initiated by Lazear and Rosen (1981). This section explores the pay gap between the CEO and the PCH from this corporate tournament perspective. We will first describe the existing theory and develop our hypotheses. Subsequently, we will discuss the data & methodology. Finally, the results of the analyses are presented.

4.4.1 Theory & hypothesis development

In this chapter the theoretical framework is created, which serves as the basis for formulating the hypotheses belonging to the research questions. Figure 4.1 shows a diagram of the theoretical framework of this section. It is structured as a corporate pyramid where we determine PCH remuneration in relation to the CEO.

Figure 4.1: Tournament theory



Most organisations have a pyramid-shaped structure (Beckman, 1977; Rosen, 1982). When a firm applies a promotion-from-within structure with uncertainty over who will be promoted, higher compensation for moving up the corporate ladder serves as a prize won by the employee that performs better compared to his colleagues. This implies that a career path is the outcome of competition among colleagues to climb the hierarchical ladder and attain higher compensation over the life cycle (Rosen, 1986). These tournament-incentives induce effort (Bognanno, 2001).

In principle, tournament theory applies to employees in all layers of the organisation. However, most research on this subject is addressed towards to the final phase of the tournament: the one to become CEO. The possibility of moving up the hierarchical ladder, with the accompanying increase in compensation, generates motivation in the tournament. However, as one approaches the top of the organisation, the possibility to engage in future rounds of promotion diminishes (Conyon et al., 2001). Rosen (1986) states that in order to keep aligning the interests of shareholders and managers, it is important to keep motivating employees to strive for promotion, all the way to the top. To facilitate these incentives, extra weight needs to be placed on the compensation increases in the upper hierarchical levels, especially when the candidate has reached the CEO position, as this is the final stage of the tournament and no future promotion opportunity (within the company) is left.

For this reason, tournament theory predicts that wage differentials between hierarchical levels increase when one moves up in the organisation. This means that there is a convex relationship between compensation and organisational level, with a significant wage gap of employees / PCHs in relation to the CEO (Conyon et al., 2001; Rajgopal and Srinivasan, 2006).

4.4.1.1 Overview existing literature

Although several researchers have written about the theoretical importance of compensation differences between CEOs and the level(s) below for incentive reasons, there is very little empirical research available. Furthermore, the research devoted to the determinants of these wage disparities is geared towards the wage difference between the CEO and the immediate and observed level below (other directors). In our research, we go one level deeper into the organisation, i.e. working with data that is not publicly available.

As a start we will summarise the findings of the existing research on the determinants of the pay gaps between CEOs and the immediate level below. In common with the prior sections, we will classify the determinants into four levels, namely: individual, firm, industry, and country effects. We will include all these elements into our regressions.

Individual effects

CEO tenure

Henderson and Fredrickson (2001) control for CEO tenure in their study. This factor has been linked to CEO pay by several researchers (Finkelstein and Hambrick, 1989; Hill and Phan, 1991; Cyert et al., 1997; Core, Holthausen and Larcker, 1999; Bebchuk et al, 2007); longer relative tenure may increase the compensation of the CEO relative to his subordinates.

Externally hired

CEOs that are hired from the outside may command higher compensation (Deckop, 1988; Bebchuk, Fried and Walker, 2002). To control for this, Henderson and Fredrickson (2001) also control for externally hired CEOs.

New CEO year

Rajgopal and Srinivasan (2006) argue that new CEOs are often paid large sign-on bonuses. They assume that the other executives on the team do not receive such large bonuses or are not replaced in the same year as the year of CEO change, and hence, expect that in the year of CEO change, the pay dispersion among the top executives increases. They find evidence to support this expectation. An alternative hypothesis is that the difference in pay is lower in this year, given the fact that the CEO only earns compensation for a part of the year.

Company effects

Firm size

It is argued that larger firms are more complex and more difficult to manage. In this case, the CEO is more valuable and has an important role in the coordination of activities (Chandler, 1962). For this reason, the CEO may attract a compensation premium, which results in a higher wage dispersion (Henderson and Fredrickson, 2001; Rajgopal and Srinivasan, 2006). Rajgopal and Srinivasan find, consistent with tournament theory, evidence for a strong relationship between large firms and higher wage dispersion.

Firm age

In the study of Rajgopal and Srinivasan (2006) it is stated that younger firms need to attract a better qualified CEO, who is able to guide the firm through the early years of existence. They argue that these firms are likely to allow larger pay dispersion among the top executive team; hence, they suggest a negative relationship between firm age and pay dispersion between CEOs and the immediate level below.

Number of subordinates

Eriksson (1999) finds a stable convex relationship between compensation and hierarchical level. He states that the larger the responsibility in terms of subordinates, the larger the wage gap.

Number of a firm's businesses (diversification)

The effect of the number of businesses within the firm on the pay gap between the CEO and the immediate level below is inconclusive. Henderson and Fredrickson (2001) argue that the number of businesses influences the coordination needs. When the businesses are related, it increases the operational interdependencies that need to be arranged. In case of unrelated businesses, the amount of information that the executive team needs to consider to evaluate investment decisions is increased. Tournament theory suggests that larger pay dispersion is effective in this case to resolve monitoring difficulties that arise from the interdependencies. On the other hand, a contradicting view involves the premise that firms with a large number of businesses have many profit centres that behave like separate entities. The managers of these profit centres have high bottom-line accountability, and hence large pay gaps between these managers and the CEO may be ineffective as this high accountability already elicits strong effort of the profit centre managers (Henderson and Fredrickson, 2001). Henderson and Fredrickson do not report conclusive results on this view and call for future research.

Shared power (CEO ≠ chair)

As discussed in section 4.3.1.1 on the determinants of CEO compensation, if the CEO is also the chairman of the board of directors, this may positively influence his level of compensation. Henderson and Fredrickson (2001) share this view and state that when the CEO is sharing the power with others, the wage dispersion may be lower as the CEO is less able to dominate the pay setting process.

Female board

Rajgopal and Srinivasan elaborate on the fact often put forth, that female executives are paid less than their male counterparts. They examined the pay dispersion in the top executive team in relation with the proportion of female managers in the top manager group, and expected to find a smaller wage gap in case of a female CEO. However, they presented the surprising result that pay dispersion is higher when a large proportion of the top executive team is female. We include a proxy for a gender effect, based on a dummy that records '1' if the CEO is female.

R&D activity / Capital investment activity

In order to create and utilise investment opportunities, firms need to attract a more skilled manager (Lazear & Rosen, 1981). Rajgopal and Srinivasan (2006) argue that firms with a dispersed compensation structure are more able to attract such managers. Hence, they state a positive relationship between pay dispersion and investment opportunities. Henderson and Fredrickson (2001) consider R&D expenditures and capital investment activity sources of coordination needs. When the investment activity and expenditures increase, the size and complexity of the projects also increases. In order to make informed choices among competing projects, CEOs need to have a thorough understanding of the characteristics of these projects. These complex decisions require significant coordination needs and demand group effort. As noted in the section on the number of a firm's businesses, in these cases larger pay gaps are efficient in order to resolve monitoring difficulties that originate from the need for team effort.

Industry effects

Elaborating on the arguments on the noisiness of firm's environment is the following finding of Rajgopal and Srinivasan (2006). They present the evidence that riskier industries are associated with larger wage disparities compared to more stable industries.

Henderson and Fredrickson (2001) collected data on the internal pay structures of firms in four industry groups, namely: chemicals, high-tech equipment, natural resources and conglomerates. They controlled for industry effects by employing dummy variables. We will follow this approach, but use more detail; i.e. 58 industry dummies (based on two-digit SIC).

Country effects

The Henderson and Fredrickson study (2001) and the paper of Rajgopal and Srinivasan (2006) are both based on a U.S. data sample. Eriksson's study (1999) involves Danish data. However, no comparison of the size of wage gaps between countries is made. Hence, due to a lack of academic literature on this topic, no implications on the effect of country factors in the size of the pay gap between CEOs and the immediate level below can be made.

4.4.1.2 Development of hypotheses

Now that we have discussed the general research on tournament theory, and the academic literature specifically concentrated on the factors influencing the wage gap between CEOs and the immediate level below, we need to transfer this to the level of the profit centre heads in our sample. Starting point is the literature overview in table 4.13.

Table 4.13: Summary determinants of remuneration gap CEO and immediate level below

This table shows an overview of the variables in the Henderson & Frederickson (2001), Rajgopal and Srinivasan (2006), Eriksson (1999) studies that have proven to be of influence on the remuneration gap between the CEO and the immediate level below.

Variable	Positive / negative effect	Reference
CEO tenure	+	Henderson & Fredrickson (2001)
Externally hired	+	Henderson & Fredrickson (2001)
Gender (female executive)	+	Rajgopal & Srinivasan (2006)
Shared power (CEO ≠ chair)	-	Henderson & Fredrickson (2001) Rajgopal & Srinivasan (2006)
Star executives	+	Rajgopal & Srinivasan (2006)
New CEO year	+	Rajgopal & Srinivasan (2006)
Number of subordinates	+	Henderson & Fredrickson (2001) Eriksson (1999)
Firm size	+	Henderson & Fredrickson (2001) Rajgopal & Srinivasan (2006)
Firm age	-	Rajgopal & Srinivasan (2006)
Noisiness of firm environment	+	Rajgopal & Srinivasan (2006) Eriksson (1999)
R&D activity / Capital investment activity	+	Henderson & Fredrickson (2001) Rajgopal & Srinivasan (2006)
Number of a firm's businesses	+	Henderson & Fredrickson (2001)

We follow the hypothesis that there will be a positive remuneration gap between the CEO and PCH. This will be the case for the two types of PCHs in our dataset: i) Directly reporting to the CEO (level 2 in the organisation); ii) One level below (level 3 in the organisation). We have seen initial evidence in the position summary table 4.8, when comparing panel A (CEO) and B (PCH). We combine the available information in our dataset with the factors presented in the academic literature into the following model:

CEO-PCH Remuneration Gap$_{it}$ = α + β_1ReportingLevelDiffernce$_{it}$ + β_2AgeDifference$_{it}$ + β_3ExternallyHiredRecentlyDifference$_{it}$ + β_4PositionTenureDifference$_{it}$ + β_5CompanyTenureDifference$_{it}$ + + β_6PositionInternationalScopeDifference$_{it}$ + β_7DummyPreviousCEO$_{it}$ + β_8DummyNewCEOYear$_{it}$ + β_9DummyCEO=Chair$_{it}$ + β_{10}CEOShareValueOwned$_{it}$+ β_{11}CEOSharePercentageOwned$_{it}$ + β_{12}DummyFemaleCEO$_{it}$ + β_{13}DummyEducation$_{it}$ + β_{14}FinancialPaper$_{it}$ + β_{15}LargePaper$_{it}$ + β_{16}MediaCEO$_{it}$ + β_{17}FirmSize$_{it}$ + β_{18}SpanofControlDifference$_{it}$ + β_{19}SalesDifference + β_{20}CompanyAge$_{it}$ + β_{21}IPOAge$_{it}$ + β_{22}Governance(DummyTwo-tierBoard)$_{it}$ + β_{23}SizeMainBoard$_{it}$ + β_{24}NED%MainBoard$_{it}$ +

β_{25}SizeSupervisoryBoard$_{it}$ + β_{26}FirmPerformance$_{it}$ + β_{27}FirmRisk$_{it}$ + β_{28}CapitalExpenditures%ofSales$_{it}$ + β_{29}BlockHolderTotal%$_{i}$ + β_{30}BlockHolderType%$_{i}$ + β_{31}DummyPresenceRemunerationCommittee$_{it}$ + β_{32}DummyPresenceRemunerationAdvisor$_{it}$ + β_{33}DummyTowersPerrin$_{it}$ + β_{34}DummyMercer$_{it}$ + β_{35}DummyNBS$_{it}$ + β_{36}DummyKepler$_{it}$ + β_{37}DummyMonksPartnership$_{it}$ + β_{38}DiversificationLevel(Conglomerate)$_{it}$ + β_{39}DummyCountry$_{it}$ β_{40}DummyIndustry$_{it}$ + β_{41}DummyTime$_{i}$ + ε_{it} **[4.2]**

Special attention is required for the board differences between the various countries. To be able to take these into account in the combined dataset we have used 4 different variables:

- Dummy variable two-tier board;
- Board size variable records the number of individuals part of the main board in the one-tier as well as two-tier governed companies;
- In order to control for the fact that there are non-executives in the board of directors of one-tier companies, we have recorded the percentage of non-executive directors in the main board (i.e. 0 for two-tier board and the relevant percentage for one-tier boards);
- To take into account the size of the supervisory board we have added this variable (i.e. 0 for one-tier governed companies and the relevant number of individuals for two-tier boards).

Finally, we have constructed a "media CEO variable".[195] Based on the LexisNexis (LN) database we were able to gain access to a large number of published articles. Our hypothesis is that CEOs that are mentioned in all types of different newspapers and magazines, build up star qualities. These people become well known and typically are engaged in a greater network. We expect the percent rank of the total hits per year in LN to be significantly (and positively) related to the CEO-PCH remuneration gap. Therefore we will test the null hypothesis that the media-CEO variable equals zero. Rejecting the null would be in line with our expectations.

Hypothesis 4.1:

H_0: media CEO variable beta = 0

H_1: media CEO variable beta > 0

We control for the number of hits in the country's largest paper / weekly magazine and the country's financial paper. The variables are constructed by taking the percent rank of the number of hits within each year, for each country. The selected sources are within the

[195] The concept of media / star CEO is known in the literature (Malmendier and Tate, 2009; Bebchuk et al., 2006).

boundaries of the availability in LexisNexis. This is a limitation as the paper/magazine may not be representative for the country. The overview is reflected in table 4.14.

Table 4.14: Overview of used papers /weekly magazines to control media-CEO variable

This table shows the available newspapers / weekly magazines in LexisNexis that were used as control variables, for the media-CEO variable we have created.[196]

Country	Large newspaper	Financial newspaper
Austria	Die Presse	Wirtschaftsblatt
Belgium	Het Nieuwsblad	De Tijd
France	Le Monde	La Tribune
Germany	Der Spiegel	Der Tagespiegel
Italy	La Stampa	MF
Netherlands (the)	De Telegraaf	Het Financieele Dagblad
Spain	El Pais	Cinco Dias
Sweden	Esmerk	Affarsvarlden
Switzerland	Le Temps	Handelszeitung
United Kingdom	The Times	The Daily Telegraph

4.4.2 Data & methodology

The starting point for the analysis is the dataset as described in section 4.2. Important for the current study is the fact that we will use CEO-PCH combinations. We have attempted to collect data for all CEOs for which we have PCHs in the dataset. Given the limited disclosure throughout Europe (especially in the early part of the research period and for non-listed companies) we did not succeed in all cases. We were able to establish 10,726 CEO-PCH firm-year combinations for which we have at least one compensation element (base salary). Adding the other direct compensation elements results in a decreasing number of observations depending on the disclosure of companies. In most cases, companies also disclose the actual bonus (but not always the target and or maximum policy level). Long-term incentives are added if applicable. Our dependent variables are in line with the ones used by Eriksson (1999), Henderson and Fredrickson (2001) and Rajgopal and Srinivasan (2006). However, similar to section 4.3, again we will sharply differentiate between ex ante (policy) levels and ex post (actual) levels.[197]

---

[196] Not available in LexisNexis: Het Laatste Nieuws (Belgium), Financial Times Deutschland (Germany), Il Carrier e della Sera (Italy), Aftonbladet (Sweden), Neue Zurcherzeitung (Switzerland), Financial Times (UK).

[197] We will not express the remuneration gaps as a percentage of base salary (as we did for the PCH in isolation study), given the fact that significant differences are found in terms of base salary between

As with the previous study on the determinants of PCH remuneration, right-hand-side variables (such as tenure and size of the PC) could not always be recorded for each case. In line with Greene (2003) we will follow the zero-order method of replacing each missing value, with the sample regressor average for all variables that are not dummies. This results in no changes and is equivalent to dropping the incomplete data. The benefit of this approach is that it is not necessary to delete the whole observation line. However, there is no free lunch. The approach has the disadvantage of resulting in a lower R^2. With regard to dummy variables from the survey, we have recorded a one if we are certain that the relevant variable is applicable. For example, for the dummy variable "externally hired" we have recorded a one in those cases were we have the information that the person is indeed externally hired and zero in all other cases. The same is true for the category variable 'international scope'. This is approach is based on the experience that if the characteristic is not relevant, it is not (always) filled in.

Our objective is to research both time variant and invariant determinants of PCH remuneration. In terms of the regression methodology, we have therefore used pooled OLS. We control for industry and country fixed effects as well as year fixed effects through 58 industry dummies, 9 country dummies and 8 year dummies. In order to account for the fact that multiple observations are related to the same company, as well as the possibility that residuals can behave non-independent within companies, we will cluster the observations per company. This results in standard errors being robust to disturbances being heteroskedastic and autocorrelated. We have avoided multicollinearity by leaving out the country the Netherlands in the country dummies, and the year 2000 in the time dummies.

In the model, all Pearson correlation coefficients are below 0.4, except for i) The governance dummy two-tier board with the size of the supervisory board (0.7598), ii) Media-CEO with the large paper and financial paper rank (0.6377, 0.6304, and 0.6273 between these papers). All coefficients remain below 0.8. More important, the total mean VIF equals 2.46, with all individual factors remaining below 10. Therefore, we have no concerns about multicollinearity.

Outliers

As a result of the fact that we deal with differences in compensation, we observe outliers (and a heteroskedasticity problem). To reduce this problem we delete the seldom observed negative and zero pay differences. We will describe these negative data at the beginning of section 4.4.3, but will take them out of the regression analysis to allow for a natural log transformation of the policy remuneration levels. The deleted observations amount to 0.6% of the base salary cases,

---

CEOs and PCHs. Working with different figures on which the percentages are based would create a distorted image.

1% of the total cash cases, and 0.8% of the total direct compensation cases. For the ex post remuneration analysis the number of negative cases is too large (e.g. 10.3% for the actual STI level) and therefore we will not delete these cases, but rely on outlier analysis for this section instead; deleting those observations with residuals greater than 4 times the standard deviation, equals 1.2% of the base salary observations, 1.3% of the total cash observations and 0.6% of the total direct compensation observations.

Endogeneity problem and sample selection bias

In this part of the research, the CEO position is part of the data sample. The impact of CEO dismissal is much larger than PCH dismissal given the fact that we observe an average of 5 to 6 PCHs per CEO. The selectivity of CEO dismissal may cause incorrect estimation of the effects of the explanatory variables. Our objective is to obtain consistent estimators. We will approach this issue by working with two alternative approaches:

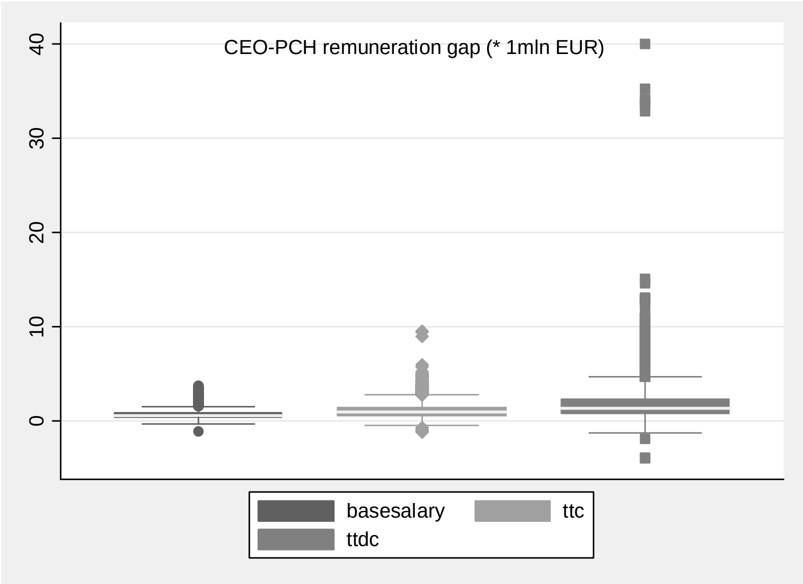
- We treat the issue as an endogeneity problem that only impacts the intercept term and apply a dummy variable that equals 1 in the year of a CEO change and 0 in all other cases;
- We treat the issue as a sample selection problem that can also affect beta terms, and censor the years in which a CEO dismissal occurs. We provide the results with correction for sample selection bias, if we have reason to believe that a bias exists. In order to still be able to work with company cluster robust standard errors we apply the full information maximum likelihood approach of Heckman (1976, 1979), in which the parameters of all equations are estimated simultaneously, (instead of the alternative two-step procedure that only allows for jackknifed and bootstrapped standard errors).

4.4.3 Results of the analyses

Graph 4.3 provides an initial overview of the differences in policy remuneration levels between CEOs and PCHs. In a very small number of cases the PCH earns more than the CEO. This is typically attributable to difference in nationalities (for example, a CEO from the Netherlands and a PCH with U.S. nationality). These types of differences are sometimes also observed in the financial services sector, if the specific PCH is considered of ultimate importance to the profitability of the company. Finally, it could be a way to camouflage high earners. Keeping such persons out the board of directors implies that there is typically no requirement to disclose pay levels. The described negative difference between the CEO and the PCH can be as much as 1 million euro at base salary level, to 4 million euro at total target direct compensation level.

Graph 4.3: Overview policy gap pay gap

This graph shows the difference in remuneration between the CEO and PCH in terms of yearly base salary, total target cash, and total target direct compensation. The figures are expressed in millions of EUR. For interpretation of the graph box, see graph 4.1.



Typically the CEO-PCH gap is positive. The mean (positive) difference between the CEO and PCH equals € 660,300 at base salary level, € 1,123,568 at total target cash level and € 1,860,411 at total direct compensation level. When working with the actual STI level these last two figures are € 1,321,936 and € 1,869,513 respectively. In line with the superstar effect as described by Rosen (1981), the difference can increase significantly, to multiples of these figures: maximum of € 3.7 mln (base salary), € 9.5 mln (TTC), 9.9 mln (TC), € 40 mln (TTDC) and € 42 mln (TDC) respectively. In the next two sections, we will provide the results of the regression analyses.

4.4.3.1 Ex ante perspective

Tables 4.15 and 4.16 present differences in policy pay levels. Table 4.15 shows the results of the full sample analysis with a dummy to account for the year in which a new CEO is hired. Table 4.16 uses sample selection techniques. The Heckit full information maximum likelihood model is used. If the approach does not result in a significant 'athro', we show the selection of observations in which no CEO change occurs.

The CEO-PCH gap is defined as CEO remuneration minus PCH remuneration for the following three items: base salary, total target cash (TTC) and total target direct compensation (TTDC).

Table 4.15: CEO-PCH remuneration gap - policy levels (full sample)

This table shows the results of the regression for the ex ante or policy compensation levels, following equation 4.2. The full sample of observations with positive remuneration difference (CEO minus PCH) is used. In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used three dependent variables: i) 'Base salary gap' equals all fixed components including elements such as vacation allowance; ii) 'TTC gap' is total target cash, which equals the sum of base salary and target cash bonus; iii) 'TTDC gap' is total target direct compensation (TTDC) which equals the sum of base salary, target cash bonus and the annualised long-term incentive value. Remuneration gap figures are expressed in EUR, and are natural log transformed. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.05; ** p<0.01; *** p<0.001. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed.

Variable	Base salary gap (ln)			TTC gap (ln)			TTDC gap (ln)		
	Coefficient		t-stat	Coefficient		t-stat	Coefficient		t-stat
Individual effects (job & personal characteristics)									
Reporting level difference	-0.326217	***	-15.76	-0.324808	***	-13.54	-0.350371	***	-11.53
	0.0000			*0.0000*			*0.0000*		
Age difference	0.011290	***	6.61	0.008770	***	4.02	0.004535		1.55
	0.0000			*0.0001*			*0.1208*		
Externally hired recently difference	-0.002181		-0.07	0.038361		1.13	0.028518		0.73
	0.9429			*0.2580*			*0.4688*		
Position tenure difference	0.001158		0.51	0.011027	*	2.33	0.009627		1.83
	0.6077			*0.0204*			*0.0686*		
Company tenure difference	-0.001993		-1.88	-0.001374		-1.13	-0.000600		-0.36
	0.0612			*0.2607*			*0.7209*		
International scope difference	0.020453		1.36	0.038068	**	2.74	0.032118		1.88
	0.1734			*0.0064*			*0.0609*		
Previous CEO	0.173486	***	3.40	0.231662	***	4.25	0.258880	***	3.60
	0.0007			*0.0000*			*0.0004*		
New CEO year	-0.141931	***	-3.38	-0.152488	**	-3.01	-0.217192	**	-3.00
	0.0008			*0.0027*			*0.0029*		
Dummy CEO = Chair	0.041954		0.53	0.038352		0.39	0.078233		0.62
	0.5950			*0.6967*			*0.5383*		
CEO share value owned	0.000000		1.64	0.000000		0.98	0.000000		0.75
	0.1011			*0.3271*			*0.4535*		
CEO share percentage owned	-0.004942		-1.21	-0.003381		-1.27	-0.004891		-1.62
	0.2255			*0.2043*			*0.1064*		
Dummy female CEO	-0.467818	*	-2.05	-0.282545		-0.95	-0.286605		-0.77

Variable	Base salary gap (ln)		TTC gap (ln)		TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0413		*0.3407*		*0.4416*	
Dummy education (PhD, Prof)	0.299334 **	2.83	0.253996 *	2.07	0.374595 *	2.30
	0.0049		*0.0386*		*0.0221*	
Financial paper (control)	-0.001415	-1.79	-0.000094	-0.10	0.000175	0.17
	0.0735		*0.9222*		*0.8619*	
Large paper (control)	-0.000205	-0.26	-0.000755	-0.86	-0.000356	-0.34
	0.7926		*0.3885*		*0.7339*	
Media CEO	0.004582 ***	4.66	0.005366 ***	4.21	0.004468 **	2.95
	0.0000		*0.0000*		*0.0033*	
Span of control difference	0.000001	1.93	0.000001 *	2.20	0.000002 **	2.93
	0.0540		*0.0286*		*0.0036*	
Sales difference	0.000000	0.41	0.000001	0.46	0.000000	0.16
	0.6812		*0.6445*		*0.8710*	
Company effects (size, age, capital, performance, risk, governance, block holders, remuneration advisor)						
Company assets (ln)	0.080689 ***	5.28	0.072968 ***	3.93	0.115302 ***	4.93
	0.0000		*0.0001*		*0.0000*	
Company age (years)	0.000229	0.59	0.000451	1.03	0.000422	0.81
	0.5522		*0.3043*		*0.4181*	
IPO age (categories)	0.016951	1.67	0.016448	1.49	0.009839	0.73
	0.0964		*0.1376*		*0.4688*	
Governance (dummy two-tier board)	-0.196174	-1.29	-0.248942	-1.52	-0.156344	-0.88
	0.1988		*0.1295*		*0.3770*	
Size of the main board	0.010938	1.29	0.006982	0.74	-0.012538	-1.11
	0.1963		*0.4600*		*0.2679*	
NED percentage on main board	-0.003331 ***	-3.44	-0.000579	-0.52	-0.001181	-0.90
	0.0006		*0.6040*		*0.3686*	
Size of the Supervisory Board	-0.002798	-0.29	0.010989	0.66	-0.033554	-1.72
	0.7734		*0.5098*		*0.0860*	
Tobin's Q (market-to-book)	0.000078	0.14	-0.000232	-0.24	-0.000351	-0.44
	0.8855		*0.8106*		*0.6594*	
Liquidity ratio	0.004307	1.02	0.004412	0.30	0.021019	0.85
	0.3062		*0.7651*		*0.3954*	
Solvency ratio	0.000470	0.46	-0.000106	-0.09	-0.000639	-0.43
	0.6476		*0.9296*		*0.6690*	
ROCE	0.001717 *	2.26	0.000346	0.46	0.000183	0.17
	0.0240		*0.6474*		*0.8620*	
Profit margin	-0.000755	-1.47	0.000108	0.25	0.000402	0.79

Variable	Base salary gap (ln)		TTC gap (ln)		TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.1409		*0.8028*		*0.4294*	
Gearing	0.000030	0.75	0.000047	1.46	0.000008	0.21
	0.4551		*0.1449*		*0.8375*	
Interest coverage	0.000045 **	2.62	0.000028	1.66	0.000053	1.48
	0.0091		*0.0968*		*0.1408*	
Capital expenditure % of sales	0.000140	0.98	0.000200	0.81	-0.000049	-0.17
	0.3284		*0.4171*		*0.8654*	
Volatility	-0.000157	-0.66	0.000059	0.47	-0.000114	-0.66
	0.5077		*0.6410*		*0.5118*	
Block holders total %	-0.002017	-1.50	-0.003556 **	-2.67	-0.004232 **	-2.74
	0.1330		*0.0078*		*0.0063*	
Block holder % (insurance company)	-0.004706	-1.92	0.003166	1.01	0.002925	0.93
	0.0551		*0.3143*		*0.3555*	
Block holder % (bank)	0.000330	0.19	0.002146	1.26	0.004341 *	2.23
	0.8501		*0.2071*		*0.0261*	
Block holder % (industrial company)	0.000458	0.40	0.002079	1.67	0.002587	1.76
	0.6917		*0.0963*		*0.0793*	
Block holder % (nominee/trust)	0.007113	1.75	0.001056	0.31	0.001856	0.48
	0.0801		*0.7591*		*0.6307*	
Block holder % (financial company)	-0.000073	-0.05	0.002644	1.66	0.002902	1.61
	0.9566		*0.0985*		*0.1092*	
Block holder % (individual / family)	0.002743	0.42	-0.003957	-0.39	-0.003340	-0.37
	0.6712		*0.6954*		*0.7135*	
Block holder % (foundation)	0.003409	1.71	0.001991	0.84	-0.000640	-0.22
	0.0881		*0.4018*		*0.8266*	
Block holder % (emp./ man./directors)	0.026695	1.56	-0.029906	-0.77	0.016552	0.33
	0.1182		*0.4432*		*0.7421*	
Block holder % (private equity)	0.001295	0.60	-0.001360	-0.64	-0.002261	-0.75
	0.5518		*0.5212*		*0.4563*	
Block holder % (state)	-0.001846	-0.94	-0.002954	-1.48	-0.004820 *	-2.03
	0.3485		*0.1388*		*0.0429*	
Dummy presence rem. comm.	0.124499 *	2.13	-0.017526	-0.22	-0.084082	-0.84
	0.0339		*0.8284*		*0.3988*	
Dummy presence rem. advisor	0.059777	1.36	0.016751	0.32	0.140050	1.88
	0.1746		*0.7495*		*0.0613*	
Dummy Towers Perrin	-0.027685	-0.53	0.043395	0.75	0.076654	1.06
	0.5937		*0.4566*		*0.2901*	
Dummy Mercer	0.177331	1.27	0.224738	1.87	0.218944	1.87

Variable	Base salary gap (ln)			TTC gap (ln)			TTDC gap (ln)		
	Coefficient		t-stat	Coefficient		t-stat	Coefficient		t-stat
	0.2051			*0.0622*			*0.0622*		
Dummy NBS	-0.058634		-0.84	-0.142731		-1.42	-0.025553		-0.29
	0.4023			*0.1577*			*0.7706*		
Dummy Kepler	-0.170941		-1.54	0.082362		0.70	0.056367		0.41
	0.1235			*0.4819*			*0.6856*		
Dummy Monks Partnership	0.311641	**	3.06	0.238842	*	2.26	0.603167	***	3.64
	0.0023			*0.0246*			*0.0003*		
Industry effects									
Diversification level (conglomerate)	-0.006798		-0.22	0.040063		1.34	0.036236		0.96
	0.8293			*0.1805*			*0.3354*		
Industry dummies (SIC two-digit)	yes			yes			yes		
Country effects									
Country dummy (Austria)	0.230174		1.19	0.170944		0.57	0.383325		0.88
	0.2327			*0.5659*			*0.3787*		
Country dummy (Belgium)	0.033209		0.25	0.090414		0.61	0.057999		0.36
	0.7990			*0.5397*			*0.7169*		
Country dummy (Spain)	0.670776	***	3.56	0.109623		0.42	-0.024462		-0.09
	0.0004			*0.6754*			*0.9311*		
Country dummy (France)	0.178491		1.61	0.031008		0.22	0.079007		0.46
	0.1087			*0.8281*			*0.6426*		
Country dummy (Germany)	0.216705		1.55	0.207408		1.28	0.616630	**	2.63
	0.1224			*0.2000*			*0.0088*		
Country dummy (Italy)	0.615918	***	4.30	0.332684		1.37	0.369457		1.06
	0.0000			*0.1710*			*0.2889*		
Country dummy (Sweden)	0.294643	*	2.42	0.079158		0.56	-0.029687		-0.16
	0.0158			*0.5784*			*0.8706*		
Country dummy (Switzerland)	-0.017799		-0.13	-0.078262		-0.46	-0.137765		-0.62
	0.8975			*0.6443*			*0.5379*		
Country dummy (UK)	0.568897	***	5.34	0.469644	***	3.98	0.435741	**	2.91
	0.0000			*0.0001*			*0.0038*		
Time effects									
Time dummies (2001-2008)	yes			yes			yes		
_cons	10.812937	***	45.65	11.325848	***	41.56	11.498706	***	31.92
	0.0000			*0.0000*			*0.0000*		

Variable	Base salary gap (ln)		TTC gap (ln)		TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Observations	10660		7311		6701	
Adjusted R^2	0.504736		0.542129		0.546943	

Table 4.16: CEO-PCH remuneration gap – policy levels (sample selection)

This table shows the results of the regression for the ex ante or policy compensation levels, following equation 4.2. In terms of the regression methodology, we have used the Heckit full information maximum likelihood model to correct sample selection bias resulting from CEO turnover. The selection equation (1 if the company stays with the company in the research year) is reflected in appendix 4.4. For this part of the model, a superset is used. For this superset we have added CEO specific characteristics (CEO age, CEO position tenure, CEO company tenure, and CEO international scope). In case of a selection bias (significant 'athro'), we follow this procedure and show the results, i.e. for 'Base salary' and 'TTC'. For TTDC we did not get a significant result. As a robustness check we censor the years in which a CEO change occurs and show the remaining selection of observations, based on pooled OLS. For both models we estimate standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used three dependent variables: i) 'Base salary gap' equals all fixed components including elements such as vacation allowance; ii) 'TTC gap' is total target cash, which equals the sum of base salary and target cash bonus; iii) 'TTDC gap' is total target direct compensation (TTDC) which equals the sum of base salary, target cash bonus and the annualised long-term incentive value. Remuneration gap figures are expressed in EUR, and are natural log transformed. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.05; ** p<0.01; *** p<0.001. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed.

Variable	Heckit Base salary gap (ln)			Heckit TTC gap (ln)			Sample OLS TTDC gap (ln)		
	Coefficient		t-stat	Coefficient		t-stat	Coefficient		t-stat
Individual effects (job & personal characteristics)									
Reporting level difference	-0.327306	***	-15.40	-0.328100	***	-13.99	-0.344798	***	-10.67
	0.0000			*0.0000*			*0.0000*		
Age difference	0.010427	***	5.60	0.009185	***	4.09	0.007089	*	2.52
	0.0000			*0.0000*			*0.0121*		
Externally hired recently difference	0.061271		1.73	0.100410	**	2.70	0.013900		0.34
	0.0843			*0.0069*			*0.7354*		
Position tenure difference	-0.003296		-1.26	0.003857		0.85	0.010428		1.93
	0.2085			*0.3961*			*0.0546*		
Company tenure difference	-0.002262	*	-2.04	-0.001179		-0.92	-0.001254		-0.81
	0.0414			*0.3594*			*0.4204*		

Variable	Heckit Base salary gap (ln)		Heckit TTC gap (ln)		Sample OLS TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
International scope difference	0.016940	1.09	0.029514 *	2.04	0.028405	1.64
	0.2737		*0.0410*		*0.1026*	
Previous CEO	0.180191 **	3.24	0.250118 ***	4.12	0.256272 ***	3.48
	0.0012		*0.0000*		*0.0006*	
Dummy CEO = Chair	-0.076386	-0.91	-0.052092	-0.52	0.104844	0.83
	0.3646		*0.6032*		*0.4097*	
CEO share value owned	0.000000	1.51	0.000000	1.13	0.000000	0.99
	0.1308		*0.2565*		*0.3252*	
CEO share percentage owned	-0.004892	-1.22	-0.003192	-1.24	-0.004007	-1.67
	0.2215		*0.2153*		*0.0951*	
Dummy female CEO	-0.652220 **	-2.97	-0.536878	-1.72	-0.453048	-1.20
	0.0029		*0.0857*		*0.2320*	
Dummy education (PhD, Prof)	0.188131	1.76	0.049391	0.49	0.174502	0.87
	0.0785		*0.6276*		*0.3825*	
Financial paper (control)	-0.001949 *	-2.43	-0.000796	-0.77	0.000330	0.31
	0.0150		*0.4442*		*0.7535*	
Large paper (control)	0.000423	0.54	0.000166	0.18	0.000138	0.13
	0.5891		*0.8586*		*0.8961*	
Media CEO	0.004246 ***	4.14	0.005028 ***	3.90	0.003141 *	2.00
	0.0000		*0.0001*		*0.0457*	
Span of control difference	0.000001 **	2.71	0.000002 **	3.29	0.000003 ***	4.33
	0.0067		*0.0010*		*0.0000*	
Sales difference	0.000000	0.41	0.000001	1.01	0.000001	0.78
	0.6786		*0.3132*		*0.4367*	
Company effects (size, age, capital, performance, risk, governance, block holders, remuneration advisor)						
Company assets (ln)	0.078395 ***	5.00	0.071648 ***	3.81	0.126185 ***	5.00
	0.0000		*0.0001*		*0.0000*	
Company age (years)	-0.000078	-0.19	0.000327	0.71	0.000489	0.93
	0.8462		*0.4801*		*0.3548*	
IPO age (categories)	0.007694	0.72	0.010562	0.87	0.008011	0.55
	0.4708		*0.3816*		*0.5832*	
Governance (dummy two-tier board)	-0.255865	-1.68	-0.284481	-1.67	-0.122828	-0.69
	0.0938		*0.0948*		*0.4900*	
Size of the main board	0.009415	1.11	0.002932	0.29	-0.013388	-1.17
	0.2663		*0.7719*		*0.2413*	
NED percentage on main board	-0.003854 ***	-4.05	-0.000786	-0.73	-0.001264	-0.99

Variable	Heckit Base salary gap (ln)		Heckit TTC gap (ln)		Sample OLS TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0001		*0.4652*		*0.3207*	
Size of the Supervisory Board	-0.005616	-0.59	0.008950	0.56	-0.039815 *	-2.12
	0.5520		*0.5721*		*0.0349*	
Tobin's Q (market-to-book)	0.000025	0.04	-0.000101	-0.12	-0.000040	-0.05
	0.9648		*0.9069*		*0.9624*	
Liquidity ratio	-0.004973	-0.99	0.008601	0.57	0.016152	0.70
	0.3224		*0.5716*		*0.4845*	
Solvency ratio	0.000826	0.74	-0.000015	-0.01	0.000129	0.09
	0.4573		*0.9912*		*0.9295*	
ROCE	0.001722 *	2.51	0.000970	1.28	0.000692	0.61
	0.0121		*0.2019*		*0.5431*	
Profit margin	-0.000413	-0.93	0.000302	0.69	0.000537	1.04
	0.3532		*0.4911*		*0.3006*	
Gearing	-0.000001	-0.02	0.000048	1.19	0.000009	0.22
	0.9880		*0.2356*		*0.8265*	
Interest coverage	0.000030	1.69	0.000014	0.78	0.000060	1.56
	0.0901		*0.4374*		*0.1200*	
Capital expenditure % of sales	0.000085	0.58	0.000208	0.82	0.000015	0.05
	0.5624		*0.4142*		*0.9619*	
Volatility	-0.000246	-1.02	0.000010	0.06	-0.000047	-0.23
	0.3086		*0.9495*		*0.8157*	
Block holders total %	-0.001819	-1.41	-0.002867	-1.94	-0.004379 **	-2.66
	0.1586		*0.0529*		*0.0081*	
Block holder % (insurance company)	-0.004955	-1.93	0.003004	0.97	0.003807	1.12
	0.0532		*0.3330*		*0.2620*	
Block holder % (bank)	0.001249	0.75	0.002783	1.57	0.004062	1.88
	0.4543		*0.1170*		*0.0605*	
Block holder % (industrial company)	0.000366	0.33	0.001821	1.34	0.002983	1.89
	0.7431		*0.1811*		*0.0597*	
Block holder % (nominee/trust)	0.006277	1.56	0.000544	0.15	0.001388	0.32
	0.1190		*0.8789*		*0.7527*	
Block holder % (financial company)	-0.000013	-0.01	0.002221	1.28	0.002994	1.59
	0.9929		*0.1997*		*0.1120*	
Block holder % (individual / family)	0.004857	0.73	-0.002098	-0.19	-0.001682	-0.17
	0.4661		*0.8480*		*0.8668*	
Block holder % (foundation)	0.001935	0.90	0.001210	0.48	-0.000351	-0.12
	0.3704		*0.6338*		*0.9077*	

Variable	Heckit Base salary gap (ln)		Heckit TTC gap (ln)		Sample OLS TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Block holder % (emp./ man./directors)	0.043163 **	2.79	-0.035813	-1.22	0.027359	0.63
	0.0052		*0.2220*		*0.5277*	
Block holder % (private equity)	0.000153	0.08	-0.002856	-1.57	-0.002993	-0.95
	0.9378		*0.1159*		*0.3422*	
Block holder % (state)	-0.000450	-0.24	-0.002391	-1.23	-0.004186	-1.74
	0.8132		*0.2198*		*0.0820*	
Dummy presence rem. comm.	0.144141 *	2.45	-0.039778	-0.47	-0.111658	-1.05
	0.0144		*0.6400*		*0.2954*	
Dummy presence rem. advisor	0.050481	1.01	0.014690	0.25	0.164192 *	2.10
	0.3104		*0.8022*		*0.0367*	
Dummy Towers Perrin	-0.081780	-1.52	-0.006381	-0.10	0.040752	0.56
	0.1280		*0.9178*		*0.5784*	
Dummy Mercer	0.056616	0.40	0.132815	1.19	0.157162	1.30
	0.6913		*0.2344*		*0.1936*	
Dummy NBS	-0.040636	-0.51	-0.104258	-0.99	-0.032967	-0.34
	0.6133		*0.3243*		*0.7372*	
Dummy Kepler	-0.205235	-1.42	-0.050054	-0.35	-0.123989	-0.76
	0.1566		*0.7294*		*0.4490*	
Dummy Monks Partnership	0.552057 ***	4.36	0.653706	1.85	0.588390 **	3.23
	0.0000		*0.0646*		*0.0013*	
Industry effects						
Diversification level (conglomerate)	-0.025800	-0.77	0.011519	0.39	0.046329	1.23
	0.4425		*0.6985*		*0.2180*	
Industry dummies (SIC two-digit)	yes		yes		yes	
Country effects						
Country dummy (Austria)	0.503044 ***	3.35	0.756910 ***	3.95	0.912741 *	2.38
	0.0008		*0.0001*		*0.0176*	
Country dummy (Belgium)	-0.002624	-0.02	0.110639	0.79	0.066689	0.41
	0.9834		*0.4290*		*0.6823*	
Country dummy (Spain)	0.612992 ***	3.42	0.132011	0.50	-0.104061	-0.35
	0.0006		*0.6153*		*0.7239*	
Country dummy (France)	0.192465	1.78	0.131149	0.91	0.114128	0.69
	0.0756		*0.3630*		*0.4880*	
Country dummy (Germany)	0.221539	1.69	0.298053 *	1.97	0.579486 **	2.75
	0.0914		*0.0485*		*0.0062*	

Variable	Heckit Base salary gap (ln)		Heckit TTC gap (ln)		Sample OLS TTDC gap (ln)	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Country dummy (Italy)	0.566353 ***	3.86	0.322803	1.31	0.333039	0.94
	0.0001		*0.1905*		*0.3487*	
Country dummy (Sweden)	0.255151 *	1.98	0.064209	0.48	-0.068709	-0.41
	0.0479		*0.6292*		*0.6804*	
Country dummy (Switzerland)	0.021493	0.13	0.010124	0.06	-0.038826	-0.17
	0.8942		*0.9540*		*0.8638*	
Country dummy (UK)	0.535829 ***	5.03	0.469501 ***	3.99	0.463023 **	3.16
	0.0000		*0.0001*		*0.0017*	
Time effects						
Time dummies (2001-2008)	yes		yes		yes	
_cons	11.128650 ***	45.56	11.527238 ***	42.35	11.340917 ***	30.45
	0.0000		*0.0000*		*0.0000*	
Observations					5694	
Adjusted R²					0.579111	
athrho	-1.7157819***		-1.3282952***			
lnsigma	-.62305902***		-.64373331***			

The observations related to table 4.15 and 4.16 are reflected below.

<u>Individual effects</u>

The tables immediately emphasise the relevance of tournament theory for all definitions of remuneration. Being further away from the CEO position (as measured by the difference in reporting level, i.e. -1 for the PCH that reports directly to the CEO and -2 for the PCH that reports indirectly to the CEO), results in a larger CEO-PCH pay gap.

Difference in age and position tenure is generally related to a higher pay gap. Difference in company tenure has a negative correlation with the base salary pay gap. This could be explained by the fact that CEOs that are longer employed by the company earn lower fixed salary increases.

If the CEO is retained from outside of the company, and especially if the candidate was already CEO, we observe a significant positive relationship with all compensation definitions.

Apparently, such a candidate is able to negotiate a significant premium, due to an already strong current position.

If the CEO is female this reduces the base salary pay gap. This could imply that companies that have a more egalitarian view on the corporate tournament (from a base salary perspective) are more likely to hire a female CEO or that the CEO earns a lower base salary in comparison to male colleagues. We find no indications that the pay gap in case of a female CEO is different on a total compensation basis.

The education dummy is positive for all definitions of pay within the full sample regression (table 4.15). Academics (PhD, professors) in a CEO position, increase the pay gap with subordinates at the 95% confidence level. It is not observed in the sample selection model.

In table 4.15 we have controlled for a new CEO year, and indeed we observe a negative relationship especially at the total (target) compensation level.

The media CEO variable is significant and positive. We will elaborate on this at the end of this section under the header: "A note on media CEOs".

Company effects

The pay gap increases with the size of the firm (measured by ln company assets), and the difference between the CEO and PCH in terms of span of control. The difference in sales responsibility does not provide for an additional significant explanatory factor.

The size of the supervisory board is a mitigating factor on the total pay gap (table 4.16). Given the fact that supervisory board members are more and more held accountable for relative differences in a company (pay building), a larger supervisory board might increase the probability that one of the members steps on the break if the gap would become larger between the top of the house and the levels below.[198]

The total percentage of block holders has a disciplining effect on the pay gap at the total direct compensation level (negative correlation).

---

[198] As an example, in the amended Dutch corporate governance code (2008), best practice provision II.2.2 states: "The supervisory board shall determine the level and structure of the remuneration of the management board…with due regard for the pay differentials within the enterprise."

We observe a positive correlation between the presence of a remuneration committee and the base salary gap. A possible explanation could be that if a remuneration committee is present, there is greater attention for the CEO pay topic. This might result in more market comparison studies, which can result in an upward force on CEO pay. In terms of overall pay governance; the presence of a remuneration committee is not associated with a smaller or a higher pay gap at the total compensation level. Nor is the presence of a remuneration advisor in the model with new CEO year dummy. In the selected sample of no change, the TTDC is positively related to the presence of remuneration advisor. In terms of the correlation with specific advisory firms, Monks Partnership seems to be linked to greater pay gaps.

Industry effects

When running the models, the dummy for financial companies was not statistically significant, implying that there is no reason to assume that the CEO-PCH gap is larger or smaller in financial companies relative to the general industry. Therefore we decided to run the model with control dummies for each two-digit SIC code. The test that the combined estimators of the 58 industries are equal to zero is refuted at the 99% confidence level. In terms of individual industries we observe positive and significant indicators (at the 99.9% confidence level) for the industries publishing, food and grocery retail stores, paper products, furniture, and clothing retail. We found negative and significant estimators for eating places retail, and railroads.

Country effects

Country differences are observed. For example, the UK exhibits higher pay gaps than the Netherlands, under all remuneration definitions.

Time effects

In terms of time effects, pay differences between the CEO and PCH have increased over the research period

A note on media CEOs

An interesting result is the fact that our proxy of a media CEO is positive and significant. The null hypothesis of 4.1 is thus rejected, in line with our expectations. CEOs that have greater media exposure exhibit a greater pay gap with subordinates under all pay policy definitions.[199] The managerial power hypothesis might provide an explanation for this. Media CEOs use their star qualities and power to increase their remuneration level. Alternatively, the positive

[199] This is mitigated at the total direct compensation level if a greater part of this media attention is caused by the financial press, rather than the overall press.

difference could be related to reputation risk. Greater exposure brings about greater personal reputation risk and demands a premium.

4.4.3.2 Ex post perspective

Tables 4.17 and 4.18 present differences in actual pay levels i.e. the CEO-PCH gap defined as CEO remuneration minus PCH remuneration, based on: i) Actual STI; ii) Total target cash (TC) which equals base salary plus target cash bonus; iii) Total direct compensation (TDC) which equals base salary plus actual cash bonus plus the annualised value of long-term incentives.

Table 4.17 shows the results of the full sample analysis with a dummy to account for the year in which a new CEO is hired. Table 4.18 uses sample selection techniques. The Heckit full information maximum likelihood model is used. If no sample selection bias is detected by the model (no significant 'athro'), we show a robustness check based on the selection of observations in which no CEO change occurs.

In section 4.3 it was shown that for the ex post remuneration model, the incorporation of ex ante remuneration levels as right-hand-side variable results in a greater explanatory value than running the regression without the target remuneration levels. Therefore we include the target STI in the actual STI regression, target total cash in the total cash regression, and target total direct compensation in the total direct compensation regression). This controls for the level of human capital and isolates the effects of size, performance, power et cetera, on actual compensation.

Table 4.17: CEO-PCH remuneration gap – actual levels (full sample)

This table shows the results of the regression for the ex post or realised compensation levels, following equation 4.2. The full sample of observations with positive remuneration difference (CEO minus PCH) is used. In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used three dependent variables: i) 'Actual STI value gap' which equals the paid out bonus; ii) 'TC gap' is total cash which equals base salary plus actual bonus; iii) 'TDC gap' is total direct compensation which equals base salary plus actual cash bonus plus the annualised value of long-term incentives. Remuneration gap figures are expressed in EUR. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed. The ex ante remuneration levels are incorporated as right-hand-side variables: i) 'STI target value gap' equals the expected or target bonus amount paid out if targets are met (instead of underperformed or exceeded); ii) 'Base salary gap' equals all fixed components including elements such as vacation allowance; iii) 'LTI value gap' equals the annualised value of all long-term incentive components (including e.g. stock options with and without condition, restricted shares and performance shares). These three elements are expressed in EUR and are natural log transformed.

Variable	Actual STI value gap			TC gap			TDC gap		
	Coefficient		t-stat	Coefficient		t-stat	Coefficient		t-stat
Individual effects (contract, job & personal characteristics)									
STI target value	1.02	***	23.11						
	0.0000								
TTC				1.03	***	138.98			
				0.0000					
TTDC							0.97	***	58.74
							0.0000		
Reporting level difference	-29315.14		-1.91	-31698.36	***	-3.47	11614.66		0.56
	0.0575			*0.0005*			*0.5748*		
Age difference	-134.70		-0.10	-382.77		-0.6	27.00		0.02
	0.9181			*0.5481*			*0.9875*		
Externally hired recently difference	328.06		0.01	-7143.69		-0.59	-795.87		-0.03
	0.9895			*0.5552*			*0.9782*		
Position tenure difference	3325.01		1.32	3056.87	*	2.46	1470.08		0.48
	0.1891			*0.0137*			*0.6296*		
Company tenure difference	718.30		0.83	509.43		1.31	-1061.85		-0.82
	0.4084			*0.1917*			*0.4139*		
International scope difference	9877.56		1.22	3253.81		0.68	6482.81		0.63
	0.2246			*0.4953*			*0.5316*		
Previous CEO	42109.56		1.15	26554.74	*	2.29	30212.19		0.60
	0.2492			*0.0221*			*0.5489*		
New CEO year	-130940.13	**	-2.84	-100029.01	***	-7.21	-174412.36	***	-4.43
	0.0048			*0.0000*			*0.0000*		
Dummy CEO = Chair	70186.71		1.36	63318.78	***	3.52	-18138.25		-0.27
	0.1740			*0.0004*			0.7852		
CEO share value owned	-0.0007		-1.68	-0.0006	***	-5.06	-0.0003		-0.86
	0.0941			*0.0000*			*0.3878*		
CEO share percentage owned	-1080.14		-0.86	-1073.13		-1.06	-645.92		-0.58
	0.3891			*0.2876*			*0.5635*		
Dummy female CEO	-184382.87	*	-2.06	-106154.93	**	-3.22	-208812.58		-1.37
	0.0403			*0.0013*			0.1724		
Dummy education (PhD, Prof)	45475.85		0.41	27196.49		1.09	-331656.56		-1.56
	0.6785			*0.2757*			*0.1188*		
Financial paper (control)	852.92		1.76	360.68		1.56	470.16		0.69

Variable	Actual STI value gap		TC gap		TDC gap	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.0789		*0.1188*		*0.4926*	
Large paper (control)	-740.58	-1.39	-315.51	-1.32	575.23	0.68
	0.1664		*0.1869*		*0.4972*	
Media CEO	173.35	0.29	158.31	0.53	-951.22	-1.03
	0.7735		*0.5952*		*0.3024*	
Span of control difference	0.00	0.00	0.01	5.4	-0.93 *	-2.34
	0.9987		*0.9106*		*0.0197*	
Sales difference	-1.49 **	-3.15	-1.56	0.11	-0.38	-0.63
	0.0017		*0.0000* ***		*0.5321*	
Company effects (size, age, capital, performance, risk, governance, block holders, remuneration advisor)						
Company assets (ln)	22191.57 *	2.08	21644.99 ***	-6.14	18069.55	1.36
	0.0383		*0.0000*		*0.1733*	
Company age (years)	-230.66	-0.50	-275.05 **	-3.23	-391.71	-0.75
	0.6172		*0.0012*		*0.4522*	
IPO age (categories)	12470.06 *	2.25	13715.20 ***	6.1	10675.11	1.49
	0.0253		*0.0000*		*0.1378*	
Governance (dummy two-tier board)	49519.89	0.68	64734.79	1.77	66229.25	0.73
	0.4945		*0.077*		*0.4687*	
Size of the main board	498.73	0.12	-1041.19	-0.6	-2104.37	-0.40
	0.9062		*0.5503*		*0.6896*	
NED percentage on main board	-323.59	-0.54	-343.83	-1.88	-303.40	-0.37
	0.5917		*0.0598*		*0.7139*	
Size of the Supervisory Board	-4815.68	-0.76	-9979.03 ***	-3.52	-15745.75	-1.82
	0.4462		*0.0004*		*0.0688*	
Tobin's Q	-928.74 **	-2.68	-931.82 ***	-4.57	-639.57	-1.30
	0.0077		*0.0000*		*0.1935*	
Liquidity ratio	45226.76 **	2.65	37340.67 ***	6.12	1840.41	0.11
	0.0083		*0.0000*		*0.9088*	
Solvency ratio	-842.53	-1.14	-674.08 *	-2.31	-1387.48	-1.75
	0.2552		*0.0208*		*0.0809*	
ROCE	1477.26	1.39	1822.55 ***	6.5	865.89	0.74
	0.1653		*0.0000*		*0.4594*	
Profit margin	-412.46	-0.58	-867.74 ***	-5.39	-752.13	-0.84
	0.5631		*0.0000*		*0.4002*	
Gearing	12.84	0.52	9.24	0.5	-22.44	-0.92
	0.6009		*0.6137*		*0.3582*	
Interest coverage	8.38	0.97	9.36	0.95	6.50	0.36

Variable	Actual STI value gap		TC gap		TDC gap	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.3317		*0.3400*		*0.7209*	
Capital expenditure % of sales	201.26	1.26	151.43 **	2.97	-70.48	-0.42
	0.2083		*0.003*		*0.6759*	
Volatility	99.50	0.78	103.16	1.11	83.08	0.66
	0.4336		*0.269*		*0.5125*	
Block holders total %	-1030.79	-1.35	-1178.84 ***	-4.19	-1514.95	-1.51
	0.1764		*0.0000*		*0.1331*	
Block holder % (insurance company)	-1033.10	-0.83	-245.04	-0.55	-924.04	-0.77
	0.4098		*0.5823*		*0.4420*	
Block holder % (bank)	440.17	0.70	906.69 **	2.62	894.06	0.90
	0.4837		*0.0087*		*0.3699*	
Block holder % (industrial company)	432.23	0.63	606.30 *	2.43	1365.49	1.63
	0.5321		*0.0152*		*0.1037*	
Block holder % (nominee/trust)	3045.09	1.70	2316.70 **	2.75	3211.91	1.44
	0.08930		*0.006*		*0.15070*	
Block holder % (financial company)	875.30	1.14	1180.63 **	3.09	1967.54	1.95
	0.2564		*0.002*		*0.0521*	
Block holder % (individual / family)	342.93	0.17	694.23	0.66	3268.00	1.20
	0.8670		*0.5081*		*0.2328*	
Block holder % (foundation)	3079.69 **	2.63	3222.24 ***	5.99	3086.51	1.77
	0.0090		*0.0000*		*0.0775*	
Block holder % (emp./ man./directors)	-5880.74	-0.37	-1250.37	-1.41	68374.82 **	3.09
	0.7090		*0.1592*		*0.0022*	
Block holder % (private equity)	-3894.94 **	-3.15	-3431.03 ***	-5.71	-1721.40	-0.94
	0.0018		*0.0000*		*0.3500*	
Block holder % (state)	3869.47	1.66	3866.27 ***	9.98	6737.79 *	2.20
	0.0976		*0.0000*		*0.0281*	
Dummy presence rem. comm.	2686.47	0.06	2933.00	0.17	129672.14	1.84
	0.9556		*0.8638*		*0.0661*	
Dummy presence rem. advisor	69993.87	1.58	70629.68 ***	5.25	-3899.95	-0.07
	0.1149		*0.0000*		*0.9451*	
Dummy Towers Perrin	34650.39	0.79	4974.41	0.28	-81712.77	-1.24
	0.4313		*0.7784*		*0.2164*	
Dummy Mercer	148485.63	1.90	169628.01 ***	4.17	132401.31	1.46
	0.0585		*0.0000*		*0.1464*	
Dummy NBS	30847.29	0.51	73604.19 **	2.73	206765.13	1.93
	0.6133		*0.0063*		*0.0548*	
Dummy Kepler	-64075.27	-0.30	-67205.18	-1.32	-339045.78	-1.47

Variable	Actual STI value gap		TC gap		TDC gap	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.7645		*0.1882*		*0.1417*	
Dummy Monks Partnership	167742.27	1.89	152931.53 *	2.17	157453.37	1.10
	0.0593		*0.0300*		*0.2724*	
Industry effects						
Diversification level (conglomerate)	30167.01	1.63	35842.74 ***	5.04	36598.01	1.40
	0.1047		*0.0000*		*0.1629*	
Industry dummies (SIC two-digit)	yes		yes		yes	
Country effects						
Country dummy (Austria)	166482.87	1.55	166847.47 **	2.63	205601.09	1.30
	0.1230		*0.0085*		*0.1957*	
Country dummy (Belgium)	1621.32	0.02	28053.68	0.94	-43049.30	-0.46
	0.9821		*0.3456*		*0.6449*	
Country dummy (Spain)	261535.93 *	2.22	249104.26 ***	6.88	311570.04 **	2.78
	0.0267		*0.0000*		*0.0057*	
Country dummy (France)	87128.58	1.25	84983.07 ***	3.43	91604.71	1.16
	0.2117		*0.0006*		*0.2470*	
Country dummy (Germany)	45590.43	0.54	92097.34 *	2.02	129824.43	1.16
	0.5923		*0.0438*		*0.2487*	
Country dummy (Italy)	190128.98 *	2.28	205716.28 ***	4.13	148333.52	0.64
	0.0230		*0.0000*		*0.5221*	
Country dummy (Sweden)	174222.61 *	2.42	182331.78 ***	5.56	64341.18	0.65
	0.0160		*0.0000*		*0.5148*	
Country dummy (Switzerland)	43759.57	0.43	30434.28	0.94	-666933.76 **	-3.12
	0.6682		*0.3462*		*0.0019*	
Country dummy (UK)	101416.83	1.76	97657.44 ***	3.91	67343.06	0.88
	0.0793		*0.0001*		*0.3779*	
Time effects						
Time dummies (2001-2008)	yes		yes		yes	
_cons	-407857.37	-2.90	-344107.33	-5.69	-91967.96	-0.52
	0.0040				*0.6043*	
Observations	5822		5919		6634	
Adjusted R²	0.763262[200]		0.890178[201]		0.936200[202]	

[200] Without taking into account the ex ante remuneration level, this figure would equal 0.4607.

Table 4.18: CEO-PCH remuneration gap – actual levels (sample selection)

This table shows the results of the regression for the ex post or realised compensation levels, following equation 4.2. In terms of the regression methodology, we have used the Heckit full information maximum likelihood model to correct sample selection bias resulting from CEO turnover. The selection equation (1 if the company stays with the company in the research year) is reflected in appendix 4.4. For this part of the model, a superset is used. For this superset we have added CEO specific characteristics (CEO age, CEO position tenure, CEO company tenure, and CEO international scope). In case of a selection bias (significant 'athro'), we follow this procedure and show the results, i.e. for 'TDC'. For 'Actual STI value' and 'TC' we did not get a significant result. As a robustness check we censor the years in which a CEO change occurs and show the remaining selection of observations, based on pooled OLS. For both models we estimate standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used three dependent variables: i) 'Actual STI value gap' which equals the paid out bonus; ii) 'TC gap' is total cash which equals base salary plus actual bonus; iii) 'TDC gap' is total direct compensation which equals base salary plus actual cash bonus plus the annualised value of long-term incentives. Remuneration gap figures are expressed in EUR. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed. The ex ante remuneration levels are incorporated as right-hand-side variables: i) 'STI target value gap' equals the expected or target bonus amount paid out if targets are met (instead of underperformed or exceeded); ii) 'Base salary gap' equals all fixed components including elements such as vacation allowance; iii) 'LTI value gap' equals the annualised value of all long-term incentive components (including e.g. stock options with and without condition, restricted shares and performance shares). These three elements are expressed in EUR.

Variable	Sample OLS Actual STI value		Sample OLS TC		Heckit TDC	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Individual effects (contract, job & personal characteristics)						
STI target value gap	1.04 ***	23.20				
	0.0000					
TTC gap			1.05 ***	33.01		
			0.0000			
TTDC gap					0.95 ***	48.03
					0.0000	
Reporting level difference	-15969.23	-1.15	-17170.37	-1.16	4307.95	0.19
	0.2511		*0.2471*		*0.8520*	

[201] Without taking into account the ex ante remuneration level, this figure would equal 0.5243.
[202] Without taking into account the ex ante remuneration level, this figure would equal 0.4472.

Variable	Sample OLS Actual STI value		Sample OLS TC		Heckit TDC	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Age difference	1363.42	1.35	554.90	0.54	1317.26	0.76
	0.1771		*0.5870*		*0.4476*	
Externally hired recently difference	5221.92	0.22	-7447.03	-0.32	78713.46 *	2.35
	0.8271		*0.7495*		*0.0186*	
Position tenure difference	871.23	0.36	1065.04	0.47	-3099.79	-0.99
	0.7208		*0.6372*		*0.3219*	
Company tenure difference	536.97	0.70	272.66	0.36	-1596.71	-1.27
	0.4863		*0.7199*		*0.2024*	
International scope difference	13048.57	1.52	7621.95	0.93	11362.78	1.07
	0.1291		*0.3506*		*0.2854*	
Previous CEO	22912.64	0.70	3364.15	0.10	17776.94	0.31
	0.4874		*0.9191*		*0.7530*	
Dummy CEO = Chair	75890.21	1.49	60719.07	1.24	6898.08	0.10
	0.1360		*0.2171*		*0.9218*	
CEO share value owned	0.00	-1.49	0.00	-1.62	0.00	-1.45
	0.1370		*0.1053*		*0.1460*	
CEO share percentage owned	-720.43	-0.72	-837.28	-0.73	-554.59	-0.45
	0.4707		*0.4662*		*0.6561*	
Dummy female CEO	-71888.29	-1.37	11277.76	0.14	-130995.26	-0.90
	0.1708		*0.8866*		*0.3665*	
Dummy education (PhD, Prof)	107761.02	1.05	96943.27	0.99	-357506.07	-1.41
	0.2932		*0.3233*		*0.1589*	
Financial paper (control)	756.29	1.55	309.86	0.64	623.53	0.80
	0.1222		*0.5232*		*0.4233*	
Large paper (control)	-806.67	-1.53	-315.89	-0.62	451.70	0.53
	0.1264		*0.5370*		*0.5944*	
Media CEO	470.97	0.71	402.69	0.59	-258.41	-0.25
	0.4810		*0.5552*		*0.8015*	
Span of control difference	-0.06	-0.20	-0.09	-0.34	-0.75	-1.90
	0.8413		*0.7319*		*0.0570*	
Sales difference	-1.53 **	-2.83	-1.70 ***	-3.56	-0.15	-0.21
	0.0050		*0.0004*		*0.8342*	
Company effects (size, age, capital, performance, risk, governance, block holders, remuneration advisor)						
Company assets (ln)	20505.67	1.82	19565.45	1.84	17751.54	1.13
	0.0698		*0.0665*		*0.2599*	
Company age (years)	-348.63	-0.69	-401.32	-0.79	-677.51	-1.17

Variable	Sample OLS Actual STI value		Sample OLS TC		Heckit TDC	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	0.4906		*0.4292*		*0.2409*	
IPO age (categories)	13143.70 *	2.27	14343.62 **	2.87	5924.61	0.69
	0.0238		*0.0043*		*0.4904*	
Governance (dummy two-tier board)	18827.62	0.24	46531.56	0.55	132596.70	1.13
	0.8090		*0.5817*		*0.2571*	
Size of the main board	103.82	0.02	-1038.48	-0.23	-1210.85	-0.19
	0.9823		*0.8190*		*0.8525*	
NED percentage on main board	-520.12	-0.90	-544.30	-1.02	135.27	0.15
	0.3692		*0.3074*		*0.8791*	
Size of the Supervisory Board	-6774.85	-0.97	-12841.85	-1.91	-19448.64 *	-2.13
	0.3314		*0.0571*		*0.0333*	
Tobin's Q (market-to-book)	-1023.67 *	-2.04	-1067.92 *	-2.14	-647.58	-1.02
	0.0416		*0.0333*		*0.3061*	
Liquidity ratio	49852.60 **	2.75	41698.80 *	2.37	19207.93	1.10
	0.0063		*0.0181*		*0.2697*	
Solvency ratio	-1269.48	-1.61	-837.04	-1.08	-1545.08	-1.73
	0.1088		*0.2823*		*0.0839*	
ROCE	1230.07	1.12	1647.68 *	2.54	743.36	0.63
	0.2632		*0.0113*		*0.5261*	
Profit margin	-405.27	-0.54	-901.94	-1.57	-480.38	-0.52
	0.5874		*0.1178*		*0.6036*	
Gearing	7.92	0.23	5.44	0.16	-46.40	-1.26
	0.8216		*0.8730*		*0.2068*	
Interest coverage	7.07	0.75	7.48	0.76	-16.12	-0.73
	0.4560		*0.4476*		*0.4681*	
Capital expenditure % of sales	248.80	1.64	187.87	1.27	-55.26	-0.38
	0.1013		*0.2052*		*0.7069*	
Volatility	86.34	0.87	93.68	0.80	3.27	0.03
	0.3857		*0.4246*		*0.9747*	
Block holders total %	-727.89	-0.92	-837.71	-1.04	-777.03	-0.69
	0.3588		*0.2980*		*0.4916*	
Block holder % (insurance company)	-977.39	-0.69	-291.83	-0.31	-1335.32	-0.92
	0.4918		*0.7530*		*0.3588*	
Block holder % (bank)	1035.41	1.50	1145.23	1.51	2318.62	1.88
	0.1343		*0.1328*		*0.0595*	
Block holder % (industrial company)	220.28	0.31	384.78	0.56	636.70	0.66
	0.7542		*0.5792*		*0.5092*	

Variable	Sample OLS Actual STI value		Sample OLS TC		Heckit TDC	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Block holder % (nominee/trust)	2038.10	1.08	1467.80	0.78	2490.00	1.11
	0.2787		*0.4366*		*0.2685*	
Block holder % (financial company)	835.79	1.03	855.66	1.04	1419.49	1.25
	0.3047		*0.3000*		*0.2117*	
Block holder % (individual / family)	279.03	0.14	187.60	0.09	2034.60	0.65
	0.8899		*0.9286*		*0.5133*	
Block holder % (foundation)	2645.08 *	2.40	2882.58 *	2.37	2116.54	1.02
	0.0168		*0.0182*		*0.3063*	
Block holder % (emp./ man./directors)	-1024.84	-0.07	1894.97	0.13	71209.52 **	2.97
	0.9430		*0.8997*		*0.0029*	
Block holder % (private equity)	-4196.06 ***	-3.41	-3880.73 **	-2.92	-3938.36	-1.85
	0.0007		*0.0037*		*0.0646*	
Block holder % (state)	4554.24	1.81	4450.96	1.74	7300.48 *	2.16
	0.0705		*0.0829*		*0.0306*	
Dummy presence rem. comm.	-17829.74	-0.38	-7322.64	-0.17	76863.85	1.03
	0.7009		*0.8658*		*0.3015*	
Dummy presence rem. advisor	114314.72 **	2.97	92445.23 *	2.46	36287.89	0.66
	0.0032		*0.0142*		*0.5118*	
Dummy Towers Perrin	24515.76	0.57	-1457.07	-0.03	-93790.48	-1.29
	0.5707		*0.9735*		*0.1969*	
Dummy Mercer	142444.59	1.79	159597.76	1.93	139302.35	1.25
	0.0738		*0.0543*		*0.2125*	
Dummy NBS	40849.15	0.61	82289.64	1.15	260116.49 *	2.15
	0.5410		*0.2525*		*0.0319*	
Dummy Kepler	-126904.69	-0.63	-144779.59	-0.70	-81945.44	-0.49
	0.5320		*0.4821*		*0.6225*	
Dummy Monks Partnership	-13204.31	-0.20	-23551.04	-0.32	197913.36	0.96
	0.8405		*0.7514*		*0.3378*	
Industry effects						
Diversification level (conglomerate)	27637.03	1.53	33550.32	1.95	44397.21	1.64
	0.1278		*0.0521*		*0.1015*	
Industry dummies (SIC two-digit)	yes		yes		yes	
Country effects						
Country dummy (Austria)	-26576.11	-0.24	-40833.92	-0.33	225470.37	1.21
	0.8069		*0.7435*		*0.2261*	

Variable	Sample OLS Actual STI value		Sample OLS TC		Heckit TDC	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Country dummy (Belgium)	29435.12	0.34	20863.62	0.24	8043.70	0.07
	0.7308		*0.8069*		*0.9448*	
Country dummy (Spain)	247470.12	1.86	221999.51	1.84	300080.99 *	2.40
	0.0641		*0.0668*		*0.0166*	
Country dummy (France)	59893.35	0.84	57364.85	0.80	83141.03	0.95
	0.4024		*0.4230*		*0.3422*	
Country dummy (Germany)	19474.55	0.22	71372.68	0.80	112358.70	0.89
	0.8275		*0.4242*		*0.3730*	
Country dummy (Italy)	128565.53	1.51	145733.97	1.64	252211.96	0.87
	0.1315		*0.1019*		*0.3858*	
Country dummy (Sweden)	178883.75 *	2.21	175248.90 *	2.12	134032.04	1.16
	0.0279		*0.0349*		*0.2475*	
Country dummy (Switzerland)	41338.84	0.40	32609.76	0.31	-778599.56 ***	-3.39
	0.6923		*0.7595*		*0.0007*	
Country dummy (UK)	67749.69	1.06	66750.59	0.99	106655.03	1.13
	0.2913		*0.3247*		*0.2601*	
Time effects						
Time dummies (2001-20008)	yes		yes		yes	
_cons	-358519.42 *	-2.53	-286569.81 *	-2.14	-119390.17	-0.60
	0.0100		*0.0300*		*0.5500*	
Observations	5185		5250			
Adjusted R²	0.776338		0.895053			
athrho					-0.874605 **	
lnsigma					13.087866 ***	

Observations related to table 4.17 and 4.18 are presented below.

Individual effects

The dummy new CEO year is associated with a smaller actual remuneration gap (table 4.17). This could be explained by the fact that the CEO is only paid for part of the year, instead of the full year.

The media CEO variable is not significant, although it was significant in the ex ante model. This could imply that media stardom helps in convincing the board of directors to take into account a higher human capital reference point (i.e. an increased ex ante remuneration level). However, other factors explain whether the CEO actually earns more or less in relation to this level. In other words, if stardom is not 'paid back' in the form of performance, there is no additional premium.

Company effects

The longer the company is listed, the higher is the actual remuneration gap (for actual STI and TC). An explanation could be that companies that are longer listed gradually move towards a stronger CEO model.

The variable 'sales difference' is negatively associated with the actual pay gap at the STI and TC level. In the previous section (ex ante perspective) we observed no significant correlation. A possible explanation could be that units that show low relative sales are often in a 'start-up' phase. The effort that it takes to build a strategy, increase market share, etc. is rewarded beyond the current level of sales only, resulting in a higher ratio between actual and target compensation. A possible variable pay program could be directed towards achieving certain milestones in the short run (without progression in the short term there is no long-term). This could also explain why we do not find significant differences related to sales for the total direct compensation gap.

Some other conclusions: i) Tobin's Q is negatively related to the actual CEO-PCH gap in terms of STI and TC. A possible explanation could be that such firms are better governed and are better able to distinguish between performers (i.e. greater appreciation for PCH performance); ii) A higher liquidity ratio is positively related to the CEO-PCH gap; iii) Private equity investors form a disciplinary mechanism on the gap (negative correlation).

Industry effects

Also in this model we have run general industry dummies based on the two-digit SIC code. Positive and significant effects (at the 99.9% confidence level) are observed for rubber and plastic products as well as glass products. A negative correlation is observed for retail (building materials as well as retail-home equipment).

Country effects

In terms of total direct compensation levels we observe a significant and positive effect for the country Spain and negative correlation for Switzerland.

Time effects

As expected, time effects are small to non-existent. As a result of taking into account target compensation levels within the regression of the actual compensation levels, time effects are already (partly) controlled for.

A note on the relevance of performance II

The analysis in this section further emphasises the results of the previous section 4.3. Even without specific details on performance at the individual profit centre level we were (again) able to explain between 76% (difference in STI actual pay-out) and 89% (difference in total cash pay-out) of the variation in the dataset. This implies that companies set targets that result in payments close to the target level of pay. If the lion share of realised pay is explained by the target pay level, this raises the question which role performance plays in its explanation.

Before answering this question, it is important to establish that the above result is rooted in human capital theory, connected to the general economic issue of scarcity. Therefore, controlling actual remuneration levels (including variable pay) for the level of human capital is the first stage in attempting to say something about the pay-for-performance hypothesis. The second stage is controlling for individual performance.

We believe that the validity of pay-for-performance theory eventually boils down to answering the question: is there evidence to believe that after controlling for individual human capital differences, performance would not play the most important part in explaining the variation in pay? In the next section we will turn to the CEO position in our attempt to answer the question.

4.5 Pay with and without performance

This section explores the pay-for-performance adage that has been put forth in academic literature, grounded in agency theory. There is quite a lot of research on this topic executed for the CEO position. In this section, we will take a different angle by confronting CEO cash bonuses with PCH bonuses.[203] We will first describe the existing theory and develop our hypotheses. Subsequently, we will discuss the data & methodology. Finally, the results of the analyses are presented.

4.5.1 Theory and hypothesis development

Agency theory, which was discussed in the introduction, states that the interests of managers and shareholders differ. Together with the difference in risk preferences and the imperfect ability of the shareholder to monitor the actions of the manager, agency costs arise. Agency theory suggests that compensation contracts should make pay contingent on observable measures of performance, with the purpose of reducing the agency costs. Section 4.3 has shown the determinants of the PCH contract in terms of level and structure.

Combining agency theory with tournament theory renders the view that the size of explicit incentives differ, depending on the position in the organisation. In section 4.4 we have researched the pay gap between the CEO and PCH. Typically, the CEO receives higher pay and higher explicit incentives. This puts forward the belief that besides explicit incentives, there are also implicit incentives (such as career concerns, Fama, 1980; Gibbons and Murphy, 1992; Holmström, 1999) that need to be optimised in combination. For CEOs these implicit incentives are typically less than for PCHs. Gibbons and Murphy (1992) for example find that career perspectives have decreased when one reaches the CEO position, as well as the present value of future compensation from promotion (Ortín-Ángel and Salas-Fumás, 1998). Our findings are therefore in line with the theory that explicit inducements in the optimal compensation contract should be the strongest for CEOs.

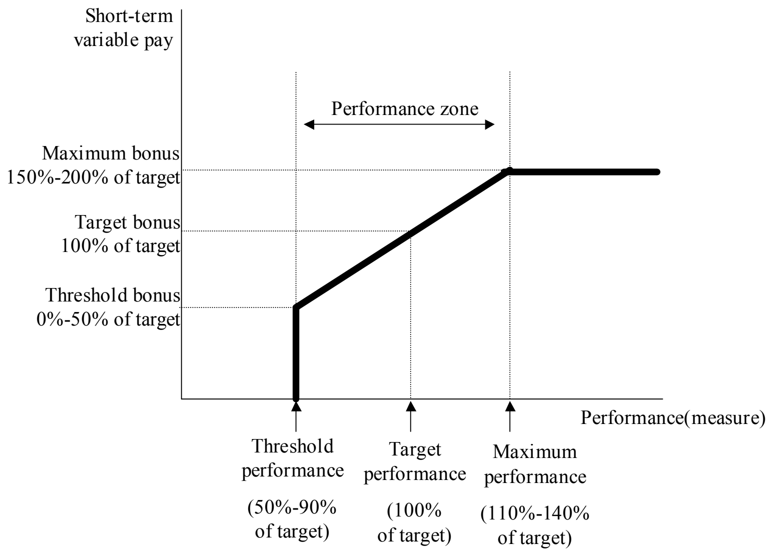
In comparing CEO and PCH actual remuneration outcomes, we thus need to control for the size of these incentives for each position as a first step. In terms of bonuses, this can be achieved by

---

[203] Short-term incentive programs are especially interesting given the fact that it has been proven insufficient to research cash incentives, only from a pay-performance perspective. An example for the Dutch market is Duffhues and Kabir (2008). The area of short-term incentive pay-outs is surrounded by different performance definitions per company, company culture, power, retention concerns, etc. As a contrast, long-term incentives are typically constructed in the form of shares and or stock options, with a direct link to the company share price (performance management is outsourced to the market in most listed firms).

taking the bonus as a percentage of base salary. As a second step we need to control for performance. Let us first look at how pay and performance are related in a bonus program. In most companies, there is an expected STI value, which is called the target STI level. If one performs better than target this results in a higher pay-out. If one performs below the set targets, this would result in a below target pay-out. A typical pay-out curve is shown in figure 4.2.[204]

Figure 4.2: Typical short-term incentive performance & pay-out zone



Controlling for target performance in the pay-out thus equals dividing the pay-out by the target bonus. Based on these two steps (actual bonus as a percentage of base salary and as a percentage of target), we have a basis to compare CEO and PCH pay-outs. It is based on bonus multipliers.

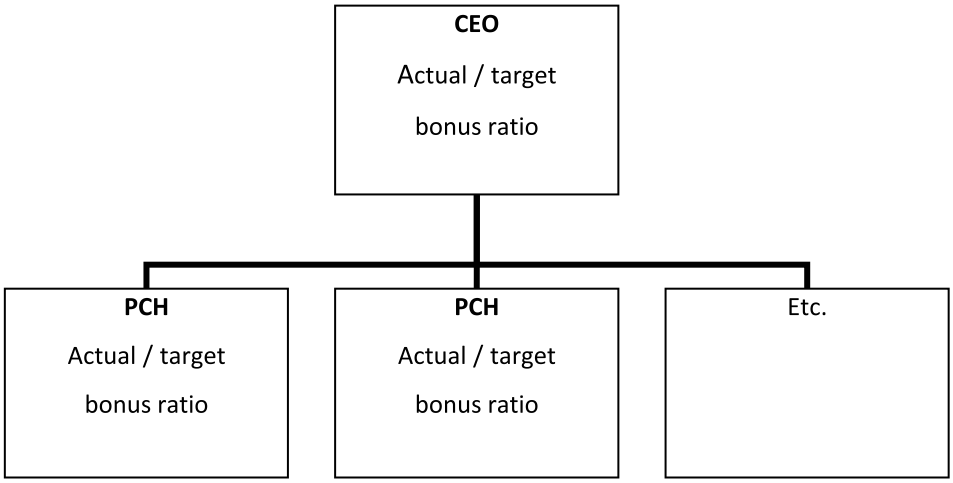
From a pay-for-performance perspective we would expect that the sum of PCH multipliers divided by the number of PCHs, i.e. the mean PCH multiplier, would provide an indication of the CEO multiplier, given the fact that the sum of business unit performance equals the total performance of the company. Figure 4.3 provides an illustration:

Figure 4.3: Actual versus target ratio (bonus multiplier)

This figure shows the bonus ratio or multiplier for the CEO and PCHs. The ratio is obtained by dividing the actual bonus by the target bonus. A PCH is responsible for his business unit. The CEO is responsible for the sum of the business units, i.e. the overall company. The average of the bonus multipliers of the

[204] If such mathematical calculation of the pay-out indeed is executed or that a less formulaic approach is used, depends among others on the company culture. These are company fixed effects that affect both the CEO as well as the PCH.

PCH positions, reflect a proxy for the overall business performance. From the perspective of pay-for-performance it is therefore expected that the CEO bonus multiplier will not deviate much from this proxy.



Hypothesis 4.2:

H_0: CEO bonus multiplier = average PCH bonus multiplier

H_1: CEO bonus multiplier ≠ average PCH bonus multiplier

If the null hypothesis is rejected, it implies that other factors than performance play the most influential role in explaining the actual pay-out levels of variable compensation of the CEO. Managerial power could provide such explanation. In terms of the power of the CEO versus a PCH, Pfeffer (1994) argues that power and social structures become more important the higher one goes up the hierarchical level. For this reason, the CEO may be better able to positively influence his own level of actual variable compensation pay-out. Bebchuk and Fried (2005) and Grinstein and Hribar (2003) among others, indicate that managerial power can be of substantial influence. Managerial power theory suggests that the CEO may have substantial influence over the board which is used to increase his pay. Bebchuk and Fried talk about excess pay defined by the difference between what a CEO would get under arm's-length bargaining and what his influence over the board enables them to obtain. A proxy for excess pay is obtained by taking our CEO bonus multiplier minus the average PCH bonus multiplier.

Especially if the null hypothesis is rejected, we would like to further research this proxy of excess pay by running a regression analysis. If the null hypothesis is not rejected, there is less reason to research differences.

4.5.2 Data & methodology

The data is a selection of the sample of 2,513 CEO-years as reflected in section 4.2. The selection is equal to all CEOs for which policy target bonus as a percentage of base salary is given, as well as the actual bonus as a % of base salary. Furthermore, both figures need to be available for the PCHs in the company. Given the fact that policy levels are not often communicated to the outside world, we rely primarily on data from the survey. The sample equals a total of 1,309 CEO years. The corresponding number of PCHs equals 5,559.

To test the hypothesis 4.2, we will apply a two-sided signed-rank test (Wilcoxon, 1945). It will test the equality of matched pairs of observations by using the Wilcoxon matched-pairs. The null hypothesis is that both distributions are the same. In addition we will apply an alternative signtest (two-sided as well as one-sided) which tests the equality of matched pairs of observations (Snedecor and Cochran, 1989) by calculating the difference between the CEO bonus multiplier and the PCH bonus multiplier. The null hypothesis for the two-sided test is that the median of the differences is zero; no further assumptions are made about the distributions in this test.

4.5.3 Results of the analyses

The results of the analyses are reflected in table 4.19.

Table 4.19: Hypothesis testing, CEO multiplier versus mean PCH multiplier – panel A

Null hypothesis (H_0)	Observations	Test statistics		H_0 rejected (yes/no)
		Type	Prob.	
Wilcoxon (1945) signed-rank test				
CEO ratio = mean PCH ratio	1,309	Two-sided	0.6403	No
Snedecor and Cochran (1989) sign test				
Median of (CEO ratio – mean PCH ratio) = 0	1,309	One-sided (Ha: > 0)	0.3134	No
Median of (CEO ratio – mean PCH ratio) = 0	1,309	One-sided (Ha: < 0)	0.7066	No
Median of (CEO ratio – mean PCH ratio) = 0	1,309	Two-sided (Ha: ≠ 0)	0.6268	No

The null hypothesis is not rejected, which results in the belief that the CEO and PCH ratio for a large sample, indeed are equal.

Robustness checks

To further test the validity of the results of table 4.19 panel A, we test two other hypotheses. The first hypothesis is that the CEO multiplier equals the multiplier of the most successful PCH (as measured by the highest bonus multiplier). This would imply that the CEO is rewarded in line with the best performing PCH. The second hypothesis is the opposite; the CEO is rewarded in line with the weakest performing PCH. Panel B and C, show the results.

Table 4.19: Hypothesis testing, CEO multiplier versus mean PCH multiplier – panel B

Null hypothesis (H_0)	Observations	Test statistics		H_0 rejected (yes/no)
		Type	Prob.	
Wilcoxon (1945) signed-rank test				
CEO ratio = high PCH ratio	1,309	Two-sided	0.0000	Yes
Snedecor and Cochran (1989) sign test				
Median of (CEO ratio – high PCH ratio) = 0	1,309	One-sided (Ha: > 0)	0.0000	Yes
Median of (CEO ratio – high PCH ratio) = 0	1,309	One-sided (Ha: < 0)	1.0000	No
Median of (CEO ratio – high PCH ratio) = 0	1,309	Two-sided (Ha: ≠ 0)	0.0000	Yes

Table 4.19: Hypothesis testing, CEO multiplier versus mean PCH multiplier – panel C

Null hypothesis (H_0)	Observations	Test statistics		H_0 rejected (yes/no)
		Type	Prob.	
Wilcoxon (1945) signed-rank test				
CEO ratio = low PCH ratio	1,309	Two-sided	0.0000	Yes
Snedecor and Cochran (1989) sign test				
Median of (CEO ratio – low PCH ratio) = 0	1,309	One-sided (Ha: > 0)	1.0000	No
Median of (CEO ratio – low PCH ratio) = 0	1,309	One-sided (Ha: < 0)	0.0000	Yes
Median of (CEO ratio – low PCH ratio) = 0	1,309	Two-sided (Ha: ≠ 0)	0.0000	Yes

Panel B and C support the conclusion from panel A. Equality is rejected in panel B and C, where it was not rejected in panel A. From the one-sided tests, we can conclude that the most successful PCH has a higher bonus multiplier than the CEO, and the least successful PCH a lower multiplier.

In summary, because the average PCH multiplier equals the CEO multiplier (as expected) there is no direct indication that the CEO bonus multiplier would be primarily related to other factors (e.g. position power) than performance as defined by the company. And if there would be other factors playing a role, they play an equal role for the CEO as well as the PCH. We believe this finding adds to the interpretation of empirical work and could be an indication of a misalignment between theory and practice where often no indication of the relations between pay and performance is found for cash incentives (e.g. Duffhues and Kabir, 2008). In practice, companies set performance standards and typically try to live up to these standards. The fact that in empirical research the relationship between pay-and-performance is not always shown could indicate that performance standards used in practice are not perfectly mimicked in empirical work. Empirical work needs to further entangle the difference between two research questions: 1) which measures are optimal versus which are used in practice?; 2) does pay respond to the measures used in practice? The latter is a difficult research question given the fact that companies typically use multiple measures and sometimes define measures differently (EVA with or without investment relief, EPS diluted or non-diluted, taking into account extraordinary items or not, etc.). We therefore promote the idea of controlling for performance in CEO compensation research and then establish the weight of other factors in explaining the remaining variation in outcomes. As shown in section 4.3 (PCH research) and 4.4 (CEO-PCH research), this can be done directly through controlling for human capital based on the target bonus. For CEO research there is an additional possibility based on controlling for performance relative to the PCHs.

Explaining the difference

Now that the null hypothesis still stands, researching the difference between CEO and PCH will be less successful, simply because we expect no large differences between the CEO and PCH multiplier. Noise can further hinder us from reaching any robust conclusions. In order to be able to say something about the difference, we subtract the PCH multiplier from the CEO multiplier (a proxy for Bebchuk's "excess compensation"), and run the regression model from the previous section, relating to the differences between PCHs and CEOs. We have taken the average differences of age, position tenure and company tenure. Differences in international scope, reporting level and being externally hired became less intuitive in a multi-PCH setting versus a single CEO, and are not added to the model. To prevent collinearity in this smaller sample, we have taken out the variables "size of the board", "size of the supervisory board "dummy two-tier companies", "sales difference", "span of control difference" (see equation 4.3). The resulting mean VIF equals 1.85 (with all individual factors below 7).

$\textbf{CEO-PCH Remuneration Gap}_{\textbf{it}} = \alpha + \beta_1\text{Var.Coeff.PCH-Ratio}_{it} + \beta_2\text{Stand.Dev.PCH-Ratio}_{it} +$
$\beta_3\text{NumberPCHs}_{it} + \beta_4\text{AgeDifference}_{it} + + \beta_5\text{PositionTenureDifference}_{it} +$
$\beta_6\text{CompanyTenureDifference}_{it} + \beta_7\text{DummyPreviousCEO}_{it} + \beta_8\text{DummyNewCEOYear}_{it} +$
$\beta_9\text{DummyCEO=Chair}_{it} + \beta_{10}\text{CEOShareValueOwned}_{it} + \beta_{11}\text{CEOSharePercentageOwned}_{it} +$

β_{12}DummyFemaleCEO$_{it}$ + β_{13}DummyEducation$_{it}$ + β_{14}FinancialPaper$_{it}$ + β_{15}LargePaper$_{it}$ + β_{16}MediaCEO$_{it}$ + β_{17}FirmSize$_{it}$ + β_{18}CompanyAge$_{it}$ + β_{19}IPOAge$_{it}$ + β_{20}NED%MainBoard$_{it}$ + β_{21}FirmPerformance$_{it}$ + β_{22}CapitalExpenditures%ofSales$_{it}$ + β_{23}FirmRisk$_{it}$ + β_{24}BlockHolderTotal%$_{i}$ + β_{25}BlockHolderType%$_{i}$ + β_{26}DummyPresenceRemunerationCommittee$_{it}$ + β_{27}DummyPresenceRemunerationAdvisor$_{it}$ + β_{28}DummyTowersPerrin$_{it}$ + β_{29}DummyMercer$_{it}$ + β_{30}DummyNBS$_{it}$ + β_{31}DummyKepler$_{it}$ + β_{32}DummyMonksPartnership$_{it}$ + β_{33}DiversificationLevel(Conglomerate)$_{it}$ + β_{34}DummyIndustry$_{it}$ + β_{35}DummyCountry$_{it}$ + β_{36}DummyTime$_{i}$ + ε_{it} **[4.3]**

As reflected in the previous section, the total number of observations equals 1,309. We have taken out 4 outliers (residuals greater than 4 times SD). We have run the model on this sample (including a dummy variable for CEO change) as well as a selection where the CEO remains in position. The latter does not likely suffer from selection bias as the Heckit regression returns a non-significant athrho. Therefore we present the outcome without the Heckit regression, in table 4.20.

Table 4.20: CEO-PCH ratio (CEO excess compensation)

This table shows the results of the regression for the ex ante or policy compensation levels, following equation 4.3. The full sample of observations is used for the regression in the left column (1,305 data combinations), and the sample of years with no CEO change for the right column (1,162). In terms of the regression methodology, we have used pooled OLS, based on estimation of standard errors that are robust to disturbances being heteroskedastic and autocorrelated. Observations are clustered per company. We have used one dependent variable: 'CEO-PCH' which equals the CEO bonus multiplier (actual divided by target STI) minus the mean PCH bonus multiplier (actual divided by target STI). This is a proxy for CEO excess compensation. It is multiplied by 100 to simplify the interpretation. The coefficient, p-value (italic) and t-statistic are reflected. Stars stand for significance: * p<0.05; ** p<0.01; *** p<0.001. Variables are reflected in the following groups: individual, company, industry, and country effects. Time dummies have been included in the model. The variable 'Company assets' is natural log transformed.

Variable	CEO-PCH (full sample)		CEO-PCH (sample)	
	Coefficient	t-stat	Coefficient	t-stat
Individual effects (contract, job & personal characteristics)				
Variation Coefficient (PCH ratio)	0.344791 ***	4.27	0.375259 ***	4.08
	0.0000		*0.0001*	
Standard Deviation (PCH ratio)	-0.521517 ***	-8.00	-0.539491 ***	-7.72
	0.0000		*0.0000*	
Age difference	0.102990	1.01	0.152451	1.06
	0.3153		*0.2882*	

Variable	CEO-PCH (full sample)		CEO-PCH (sample)	
	Coefficient	t-stat	Coefficient	t-stat
Position tenure difference	1.394206 *	2.50	1.009700*	1.98
	0.0128		*0.0479*	
Company tenure difference	-0.050483	-0.31	-0.045865	-0.28
	0.7586		*0.7786*	
New CEO year	-20.742652 ***	-4.02		
	0.0001			
CEO externally hired recently	3.437756	0.75	8.088518	1.70
	0.4525		*0.0897*	
Number of PCHs	0.148328	0.36	0.282185	0.65
	0.7192		*0.5149*	
Previous CEO	6.133647	1.51	3.852394	0.88
	0.1320		*0.3798*	
Dummy CEO = Chair	-7.496000	-1.20	-7.398158	-1.10
	0.2326		*0.2709*	
CEO share value owned	0.000000	-0.32	0.000000	-0.14
	0.7501		*0.8877*	
CEO share percentage owned	-2.167653 **	-2.91	-1.924673 *	-2.26
	0.0038		*0.0244*	
Dummy female CEO	-24.125582 ***	-3.87	-24.489363 ***	-3.58
	0.0001		*0.0004*	
Dummy education (PhD, Prof)	11.225112	0.88	11.852579	0.90
	0.3793		*0.3665*	
Financial paper (control)	0.051500	0.66	0.061987	0.75
	0.5106		*0.4553*	
Large paper (control)	-0.094521	-1.62	-0.125452 *	-1.98
	0.1063		*0.0484*	
Media CEO	0.020198	0.22	0.039891	0.40
	0.8283		*0.6867*	
Company effects (size, age, capital, performance, risk, governance, block holders, remuneration advisor)				
Company assets (ln)	0.411491	0.37	0.343438	0.32
	0.7139		*0.7461*	
Company age (years)	-0.012933	-0.42	-0.017617	-0.50
	0.6778		*0.6199*	
IPO age (categories)	0.458116	0.68	0.595426	0.84
	0.4983		*0.3994*	
NED percentage on main board	0.035368	0.31	0.015049	0.12
	0.7534		*0.9071*	

Variable	CEO-PCH (full sample)		CEO-PCH (sample)	
	Coefficient	t-stat	Coefficient	t-stat
Tobin's Q (market-to-book)	-0.047676	-1.55	-0.042927	-1.10
	0.1230		*0.2735*	
Liquidity ratio	-0.284054	-0.55	-0.399647	-0.79
	0.5801		*0.4305*	
Solvency ratio	0.072130	0.79	0.105060	1.13
	0.4311		*0.2587*	
ROCE	0.088906	1.26	0.115231	1.58
	0.2100		*0.1150*	
Profit margin	0.007514	0.14	-0.020493	-0.38
	0.8867		*0.7023*	
Gearing	-0.001056	-0.30	0.001538	0.45
	0.7673		*0.6512*	
Interest coverage	0.000180	0.21	-0.000195	-0.22
	0.8320		*0.8245*	
Capital expenditure % of sales	-0.003260	-1.48	-0.002869	-1.25
	0.1401		*0.2126*	
Volatility	-0.007988	-0.62	-0.005458	-0.44
	0.5326		*0.6604*	
Block holders total %	0.044492	0.53	0.028627	0.31
	0.5987		*0.7560*	
Block holder % (insurance company)	0.036134	0.26	-0.012160	-0.08
	0.7914		*0.9328*	
Block holder % (bank)	-0.103193	-0.95	-0.011720	-0.11
	0.3418		*0.9164*	
Block holder % (industrial company)	-0.030048	-0.39	0.015923	0.19
	0.6977		*0.8455*	
Block holder % (nominee/trust)	0.092402	0.53	-0.061815	-0.34
	0.5976		*0.7334*	
Block holder % (financial company)	0.002791	0.02	-0.001644	-0.01
	0.9801		*0.9896*	
Block holder % (individual / family)	-0.415743	-1.36	-0.275737	-0.85
	0.1737		*0.3951*	
Block holder % (foundation)	0.210493	1.75	0.217998	1.73
	0.0810		*0.0850*	
Block holder % (emp./ man./directors)		.		.
	.		.	
Block holder % (private equity)	-0.617536 ***	-4.00	-0.656953 ***	-3.58
	0.0001		*0.0004*	

Variable	CEO-PCH (full sample)		CEO-PCH (sample)	
	Coefficient	t-stat	Coefficient	t-stat
Block holder % (state)	-0.059741	-0.70	0.039320	0.43
	0.4860		*0.6692*	
Dummy presence rem. comm.	-0.198201	-0.04	-3.593751	-0.63
	0.9707		*0.5280*	
Dummy presence rem. advisor	8.913216	1.80	11.352372 *	2.41
	0.0730		*0.0164*	
Dummy Towers Perrin	1.340957	0.28	2.407764	0.47
	0.7783		*0.6390*	
Dummy Mercer	51.311673 **	3.24	50.428093 **	3.30
	0.0013		*0.0011*	
Dummy NBS	6.586786	0.72	10.495827	0.97
	0.4734		*0.3341*	
Dummy Kepler	-20.013037	-1.36	-25.358605	-1.76
	0.1732		*0.0796*	
Dummy Monks Partnership	-3.504332	-0.15	-23.079893	-0.87
	0.8810		*0.3837*	
Industry effects				
Diversification level (conglomerate)	-0.804482	-0.37	0.216633	0.10
	0.7087		*0.9207*	
Industry dummies (SIC two-digit)	yes		yes	
Country effects				
Country dummy (Austria)	-3.301640	-0.17	-2.287343	-0.12
	0.8685		*0.9066*	
Country dummy (Belgium)	5.593823	0.42	9.673561	0.63
	0.6721		*0.5321*	
Country dummy (Spain)	37.004573 *	2.45	42.603857 *	2.42
	0.0148		*0.0159*	
Country dummy (France)	16.566086	1.75	18.564072	1.76
	0.0809		*0.0800*	
Country dummy (Germany)	65.563309	1.49	72.336355	1.16
	0.1367		*0.2457*	
Country dummy (Italy)	17.548015	1.43	21.773794	1.51
	0.1531		*0.1307*	
Country dummy (Sweden)	-1.696394	-0.13	2.913730	0.20
	0.8940		*0.8393*	
Country dummy (Switzerland)	3.012386	0.25	7.415368	0.55

Variable	CEO-PCH (full sample)		CEO-PCH (sample)	
	Coefficient	t-stat	Coefficient	t-stat
	0.8018		*0.5844*	
Country dummy (UK)	-1.220451	-0.15	1.222888	0.13
	0.8823		*0.8946*	
Time effects				
Time dummies (2001-2008)	yes		yes	
_cons	-18.896826	-1.09	-19.182618	-1.17
	0.2769		*0.2430*	
Observations	1305		1162	
Adjusted R²	0.217914		0.228357	

As expected, the adjusted R^2 is relatively low (around the 20%). The observations related to table 4.20 are described below:

<u>Individual effects</u>

Female CEOs are correlated with significantly lower actual bonus pay-outs in relation to the PCH standard. Given the fact that top executives (including PCHs) are more often male than female, this could be an indicator of inequality.

CEOs with longer relative position tenure are able to negotiate higher actual bonus pay-outs, judging from a significant correlation between excess remuneration and position tenure.

The percentage of share ownership is negatively correlated with excess compensation. CEOs with large share ownership seem to be less inclined to use this power in order to receive a bonus pay-out that cannot be justified by performance. Wealth changes as a result of share price movements will be of greater concern.

The variables 'variation coefficient' and 'standard deviation' are both indicators of the distribution of the PCH ratio. In conjunction, the effect is negative. In other words, the CEO is less able to negotiate a higher actual bonus multiplier if the variation in performance of the various business units, is more diverse. Volatility is thus not rewarded. If the CEO succeeds in rendering stable business results throughout the firm, he earns a higher bonus (and vice versa).

Company effects

The presence of private equity investors results in a disciplining effect on the CEO bonus (negative correlation).

In the sample of years with no CEO change, we observe a positive and significant correlation (at the 95% confidence level) between the disclosure of the presence of a remuneration advisor.[205] This could imply that remuneration advisors are associated with higher actual compensation for CEOs beyond the average performance of the PCHs. An alternative explanation could be that companies that pay a higher actual bonus multiplier to the CEO are more likely to disclose the fact that there was a remuneration advisor in place, to justify this practice.

Industry effects

Because the dummy for financial companies is not significant, we have included general industry dummies based on the two-digit SIC codes. Specific industry practices are observed. Positive correlation at 99.9% confidence level: mining, rubber & plastic products, services (motion pictures); Negative correlation at 99.9% confidence level: retail (building materials).

Country effects

In Spain, CEOs seem to have more power (than in the Netherlands and the other companies) to obtain “excess compensation”. This could indicate a relative weakness in the corporate governance system and may be a concern for investors.

---

[205] In addition, the human resources advisory company Mercer is significantly associated with higher actual bonus multipliers for the CEO.

4.6 Summary & conclusion

In the quest for survival, businesses try to obtain a strategic advantage. This is achieved by means of optimally financing the business, developing a superior strategy and executing this strategy. It goes without saying that human capital is indispensable in this equation; attracting the best people to the organisation, retaining them and motivating them to deploy their abilities at the benefit of the company. It can be safely assumed that the success of the business is a positive function of the amount of talent in the organisation. Human capital becomes additionally important when one moves up the corporate ladder. This is because decisions geometrically affect the organisation; positively or negatively. The CEO has final decisive power. However, an important part of his power is cascaded to managers, so called profit centre heads (PCH), that report directly or indirectly to him. These individuals have profit & loss responsibility for a part of the business and / or are jointly responsible for the total company. In light of the aforementioned topics of attraction, retention and motivation, as well as the general topic of optimally financing the business, the following questions arise:

1) What are the determinants of profit centre head remuneration?
2) What are the determinants of the CEO-PCH remuneration gap?
3) Do CEOs have more power to influence their actual bonus than PCHs?

Answers to these questions are not abundant given the relative absence of empirical research, especially for the European context. Based on a proprietary dataset, made available by Towers Perrin, we were able to research these questions.

4.6.1. Summary

In the tables 4.21 to 4.25 we provide overviews of our statistically significant findings from the most relevant models of section 4.3 to 4.5 and the associated economic effects. The 58 industry dummies are not reflected. We have used these dummies to control for (industry) fixed effects.

Table 4.21: PCH policy pay levels: economic effects of statistically significant findings

This table shows an overview of the statistically significant findings, of equation 4.1, for ex ante (or policy) remuneration levels, as well as the economic effects (see table 4.10). 'Sig' stands for significance level. 'Ec. Effect' stands for economic effect. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient.

Variable	Base salary (ln)		TTC (ln)		TTDC (ln)	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
Age	***	0.06	***	0.06	***	0.05
Block holder % (emp./ man./directors)	**	-0.07	***	-0.09	*	-0.09
Block holder % (industrial company)	*	0.04	*	0.05	n.s.s.	
Block holder % (insurance company)	*	0.01	**	0.03	**	0.05
Block holders total %	n.s.s.		**	-0.06	***	-0.09
Company assets (ln)	***	0.16	***	0.18	***	0.23
Company employees	***	0.05	**	0.05	*	0.06
Company tenure	***	-0.03	***	-0.03	***	-0.04
Country dummy (Austria)	**	-0.35	**	-0.34	**	-0.50
Country dummy (Belgium)	*	-0.10	*	-0.15	**	-0.26
Country dummy (France)	***	-0.19	***	-0.26	**	-0.20
Country dummy (Germany)	***	-0.26	**	-0.15	*	-0.16
Country dummy (Spain)	**	-0.17	n.s.s.		*	-0.18
Country dummy (Sweden)	***	-0.51	***	-0.66	***	-0.83
Country dummy (Switzerland)	***	-0.49	***	-0.52	***	-0.43
Country dummy (UK)	***	0.37	***	0.35	***	0.38
Dummy externally hired recently	*	0.04	n.s.s.		n.s.s.	
Governance (dummy two-tier board)	**	-0.08	*	-0.09	n.s.s.	
Interest coverage	***	0.02	***	0.03	***	0.03
International scope	***	0.08	***	0.11	***	0.14
IPO age	**	0.03	**	0.04	*	0.05
PC relative size	***	0.07	***	0.07	***	0.09
Reporting level	***	-0.20	***	-0.23	***	-0.25
Span of control	***	0.04	***	0.04	***	0.04
Time dummy (2001)	***	0.09	***	0.11	n.s.s.	
Time dummy (2002)	**	0.09	***	0.14	n.s.s.	
Time dummy (2003)	***	0.12	***	0.23	n.s.s.	
Time dummy (2004)	***	0.14	***	0.25	*	0.13
Time dummy (2005)	***	0.18	***	0.31	***	0.18
Time dummy (2006)	***	0.19	***	0.33	**	0.17
Time dummy (2007)	***	0.18	***	0.34	***	0.23
Time dummy (2008)	***	0.16	***	0.30	**	0.16

Table 4.22: PCH actual pay levels: economic effects of statistically significant findings – panel A

This table shows an overview of the statistically significant findings, of equation 4.1, for ex post (or actual) remuneration levels, as well as the economic effects (see table 4.12-A). 'Sig' stands for significance level. 'Ec. Effect' stands for economic effect. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient. Panel A refers to the regression without incorporation of the ex ante remuneration levels as right-hand-side variables.

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
Age	***	0.05	***	0.06	***	0.06
Block holder % (bank)	*	0.05	n.s.s.		n.s.s.	
Block holder % (emp./ man./directors)	n.s.s.		*	-0.07	n.s.s.	
Block holder % (financial company)	***	0.08	*	0.03	*	0.03
Block holder % (individual / family)	n.s.s.		n.s.s.		n.s.s.	
Block holder % (industrial company)	n.s.s.		***	0.07	*	0.07
Block holder % (insurance company)	n.s.s.		**	0.03	**	0.04
Block holder % (state)	n.s.s.		n.s.s.		n.s.s.	
Block holders total %	***	-0.16	***	-0.08	***	-0.10
Company assets (ln)	***	0.36	***	0.22	***	0.25
Company employees	n.s.s.		*	0.05	*	0.05
Company tenure	***	-0.06	***	-0.04	***	-0.04
Country dummy (Austria)	*	-0.48	*	-0.41	**	-0.55
Country dummy (Belgium)	n.s.s.		*	-0.15	**	-0.24
Country dummy (France)	***	-0.39	***	-0.22	**	-0.18
Country dummy (Germany)	*	0.19	**	-0.22	**	-0.22
Country dummy (Spain)	n.s.s.		n.s.s.		*	-0.19
Country dummy (Sweden)	***	-0.99	***	-0.62	***	-0.79
Country dummy (Switzerland)	**	-0.46	***	-0.48	***	-0.43
Country dummy (UK)	***	0.42	***	0.35	***	0.38
Governance (dummy two-tier board)	*	-0.23	**	-0.13	*	-0.14
Interest coverage	***	0.03	***	0.03	***	0.03
International scope	***	0.17	***	0.11	***	0.14
IPO age	*	0.06	**	0.04	**	0.06
PC relative size	***	0.08	***	0.07	***	0.09
Position tenure	***	0.04	***	0.02	**	0.03
Reporting level	***	-0.31	***	-0.23	***	-0.25
ROCE	***	0.10	***	0.03	***	0.04
Span of control	**	0.04	***	0.04	***	0.04
Time dummy (2001)	**	0.20	***	0.12	n.s.s.	

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
Time dummy (2002)	*	0.16	***	0.14	n.s.s.	
Time dummy (2003)	***	0.29	***	0.18	n.s.s.	
Time dummy (2004)	***	0.31	***	0.18	n.s.s.	
Time dummy (2005)	***	0.49	***	0.24	*	0.13
Time dummy (2006)	***	0.48	***	0.28	*	0.14
Time dummy (2007)	***	0.62	***	0.33	***	0.22
Time dummy (2008)	***	0.57	***	0.29	**	0.16

Table 4.22: PCH actual pay levels: economic effects of statistically significant findings – panel B

This table shows an overview of the statistically significant findings, of equation 4.1, for ex post (or actual) remuneration levels, as well as the economic effects (see table 4.12-B). 'Sig' stands for significance level. 'Ec. Effect' stands for economic effect. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient. Panel B refers to the regression with incorporation of the ex ante remuneration levels as right-hand-side variables.

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
Age	n.s.s.		n.s.s.		**	-0.01
Base salary (ln)			***	0.45	***	0.34
Block holder % (bank)	*	0.03	n.s.s.		*	0.01
Block holder % (emp./ man./directors)	n.s.s.		*	0.01	***	0.02
Block holder % (financial company)	*	0.03	n.s.s.		n.s.s.	
Block holder % (individual / family)	n.s.s.		*	0.01	*	0.01
Block holder % (industrial company)	*	0.06	***	0.03	**	0.02
Block holder % (insurance company)	*	-0.02	n.s.s.		n.s.s.	
Block holder % (state)	n.s.s.		***	0.02	**	0.02
Block holders total %	*	-0.07	***	-0.03	***	-0.03
Company assets (ln)	***	0.11	*	0.02	n.s.s.	
Country dummy (Germany)	n.s.s.		n.s.s.		*	-0.09
Dummy externally hired recently	n.s.s.		***	-0.05	n.s.s.	
Dummy financial company	n.s.s.		**	0.06	**	0.05
Interest coverage	*	0.01	n.s.s.		n.s.s.	
International scope	**	0.03	**	0.01	**	0.01
LTI value (ln)					***	0.28

Variable	Actual STI value (ln)		TC (ln)		TDC (ln)	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
PC relative size	n.s.s.		*	-0.01	n.s.s.	
Position tenure	**	0.03	***	0.02	***	0.02
Reporting level	***	-0.04	n.s.s.		n.s.s.	
ROCE	***	0.08	**	0.02	*	0.01
STI target value (ln)	***	0.79	***	0.20	***	0.16
Time dummy (2007)	n.s.s.		*	0.04	n.s.s.	

Table 4.23: CEO-PCH remuneration gap – policy levels: economic effects of statistically significant findings

This table shows an overview of the statistically significant findings, of equation 4.2, for ex ante (or policy) remuneration levels, as well as the economic effects (see table 4.16). 'Sig' stands for significance level. 'Ec. Effect' stands for economic effect. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient.

Variable	Heckit Base salary gap (ln)		Heckit TTC gap (ln)		Sample OLS TTDC gap (ln)	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
Age difference	***	0.07	***	0.06	*	0.05
Block holder % (emp./ man./directors)	**	0.05	n.s.s.		n.s.s.	
Block holders total %	n.s.s.		n.s.s.		**	-0.14
Company assets (ln)	***	0.15	***	0.14	***	0.25
Company tenure difference	*	-0.03	n.s.s.		n.s.s.	
Country dummy (Austria)	***	0.50	***	0.76	*	0.91
Country dummy (Germany)	n.s.s.		*	0.30	**	0.58
Country dummy (Italy)	***	0.57	n.s.s.		n.s.s.	
Country dummy (Spain)	***	0.61	n.s.s.		n.s.s.	
Country dummy (Sweden)	*	0.26	n.s.s.		n.s.s.	
Country dummy (UK)	***	0.54	***	0.47	**	0.46
Dummy female CEO	**	-0.65	n.s.s.		n.s.s.	
Dummy Monks	***	0.55	n.s.s.		**	0.59
Dummy presence rem. advisor	n.s.s.		n.s.s.		*	0.16
Dummy presence rem. comm.	*	0.14	n.s.s.		n.s.s.	
Externally hired recently difference	n.s.s.		**	0.10	n.s.s.	
Financial paper (control)	*	-0.06	n.s.s.		n.s.s.	
International scope difference	n.s.s.		*	0.02	n.s.s.	

Media CEO	***	0.13	***	0.15	*	0.09
NED percentage on main board	***	-0.15	n.s.s.		n.s.s.	
Previous CEO	**	0.18	***	0.25	***	0.26
Reporting level difference	***	-0.16	***	-0.16	***	-0.17
ROCE	*	0.03	n.s.s.		n.s.s.	
Size of the Supervisory Board	n.s.s.		n.s.s.		*	-0.20
Span of control difference	**	0.07	**	0.12	***	0.16
Time dummy (2001)	*	0.15	**	0.24	n.s.s.	
Time dummy (2002)	*	0.15	***	0.34	n.s.s.	
Time dummy (2003)	**	0.16	***	0.26	n.s.s.	
Time dummy (2004)	*	0.13	**	0.25	**	0.33
Time dummy (2005)	***	0.22	***	0.38	***	0.51
Time dummy (2006)	**	0.19	***	0.40	***	0.48
Time dummy (2007)	**	0.20	***	0.43	***	0.53
Time dummy (2008)	***	0.28	***	0.52	***	0.65

Table 4.24: CEO-PCH remuneration gap – actual levels: economic effects of statistically significant findings

This table shows an overview of the statistically significant findings, of equation 4.2, for ex post (or actual) remuneration levels, as well as the economic effects (see table 4.18). 'Sig' stands for significance level. 'Ec. Effect' stands for economic effect. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient. The regression is run with incorporation of the ex ante remuneration levels as right-hand-side variables.

Variable	Sample OLS Actual STI value gap		Sample OLS TC gap		Heckit TDC gap	
	Sig.	Ec. Effect	Sig.	Ec. Effect	Sig.	Ec. Effect
Block holder % (emp./ man./directors)	n.s.s.		n.s.s.		**	79235
Block holder % (foundation)	*	20207	*	22022	n.s.s.	
Block holder % (private equity)	***	-26349	**	-24369	n.s.s.	
Block holder % (state)	n.s.s.		n.s.s.		*	98325
Country dummy (Spain)	n.s.s.		n.s.s.		*	300081
Country dummy (Sweden)	*	178884	*	175249	n.s.s.	
Country dummy (Switzerland)	n.s.s.	41339	n.s.s.		***	-778600
STI target value gap	***	533624				
TTC gap			***	842737		
TTDC gap					***	1901910

Dummy NBS	n.s.s.		n.s.s.		*	260116
Dummy presence rem. advisor	**	114315	*	92445	n.s.s.	
Dummy presence rem. comm.	n.s.s.		n.s.s.		n.s.s.	
Externally hired recently difference	n.s.s.		n.s.s.		*	78713
IPO age (categories)	*	36080	**	39374	n.s.s.	
Liquidity ratio	**	104170	*	87132	n.s.s.	
ROCE	n.s.s.		*	26419	n.s.s.	
Sales difference	**	-39723	***	-44021	n.s.s.	
Size of the Supervisory Board	n.s.s.		n.s.s.		*	-99059
Solvency ratio	n.s.s.		*	-16299	n.s.s.	
Time dummy (2002)	n.s.s.		*	-109518	n.s.s.	
Tobin's Q (market-to-book)	*	-16579	*	-17296	n.s.s.	

Table 4.25: Excess remuneration: economic effects of statistically significant findings

This table shows an overview of the statistically significant findings, of equation 4.3, as well as the economic effects (see table 4.20). 'Sig' stands for significance level. 'Ec. Effect' stands for economic effect. The economic effect is calculated, based on an event size of 1 standard deviation ((coefficient * (mean + 1SD)) – (coefficient * mean)). For dummy variables, the economic effect is equal to the b-coefficient.

Variable	CEO-PCH (full sample)		CEO-PCH (sample selection)	
	Sig.	Ec. Effect	Sig.	Ec. Effect
Block holder % (private equity)	***	-3.51	***	-3.73
CEO share percentage owned	**	-3.23	*	-2.87
Country dummy (Spain)	*	37.00	*	42.60
Large paper (control)	n.s.s.		*	-5.17
Dummy female CEO	***	-24.13	***	-24.49
Dummy Mercer	**	51.31	**	50.43
Dummy presence rem. advisor	n.s.s.		*	11.35
New CEO year	***	-20.74		
Position tenure difference	*	5.09	*	3.69
Standard Deviation (PCH ratio)	***	-21.65	***	-22.39
Variation Coefficient (PCH ratio)	***	11.09	***	12.07

4.6.2 Conclusion

This research chapter emphasises the importance of contingency studies in the area of remuneration research for top managers, based on multiple variables. As reflected in the summary (see section 4.6.1), there are individual, company, industry, country and time effects that can contribute to understanding the drivers of managerial compensation.

In this conclusion we will explore 7 overarching themes that are based on the findings in this PCH research chapter. We will discuss the following subjects:

1. Managerial compensation theories – ex ante versus ex post perspective
2. Corporate governance & sources of CEO power
3. Career concerns – is company loyalty rewarded?
4. Does gender matter?
5. Industry effects – dynamics in the financial services sector
6. Country effects – the prince and the pauper revisited
7. Time effects – a decade of growing CEO power?

<u>1) Managerial compensation theories – ex ante versus ex post perspective</u>

In this chapter we have strictly differentiated between policy (ex ante) and actual (ex post) pay levels.[206] This two-step approach enables us to better evaluate the explanatory power of different theories of managerial remuneration as set forth below.

Ex ante compensation

The total direct (ex ante) remuneration level equals the sum of fixed compensation in combination with the bonus level under expected (target) performance and the annualised value of long-term incentives. It refers to the price that needs to be paid for attracting and retaining scarce human capital from the labour market. When the qualifications, expertise and skills required carrying out the job increase, the relative supply diminishes, resulting in higher pay. In our regression study of section 4.3 we observe that the complexity of the PCH job (e.g. defined in terms of international scope, span of control, relative size of the profit centre), is positively and significantly correlated to the ex ante remuneration level. The level of complexity and accountability increases when one moves up the corporate hierarchy. Human capital theory thus explains that there is a CEO-PCH pay gap, based on relative scarcity. It also explains why we observe a different PCH pay gap between managers that report directly to the CEO (level 2 in

[206] Within the ex post remuneration levels, we were able to further distinguish between pay that is related to performance and pay related to other factors ('excess remuneration').

the organisation) and PCHs that indirectly report to the CEO (level 3 in the organisation). The significance of pay gaps within the organisation is typically explained from a corporate tournament theory perspective; significant gaps can be an optimal strategy for a company from an overall incentive viewpoint.

Ex post compensation

When moving from ex ante to ex post compensation, we are moving from the start of the performance period to the end of this period. Deviations from the expected performance level in a variable pay system result in pay-out deviations from the expected or ex ante remuneration level; i.e. higher or lower pay than expected. This perspective results in a more realistic setting for empirical research, than assuming that the absolute value of variable pay is completely driven by performance.[207] Our research findings in section 4.3 and 4.4 emphasise this point. Even without specific details on performance at the individual profit centre level, we were able to explain between 75% (difference in STI actual pay-out) and 91% (difference in total cash pay-out) of the variation in the dataset. We observed that the lion share is explained by controlling for the underlying policy levels. It seems that we need to come up with different terminology in light of the explanation of bonus pay-outs by performance. The term 'bonus' as such may not be an effective term to help explain the executive remuneration landscape. A bonus would imply an additional pay-out on top of the fixed salary, based on good performance. In reality, the reference point is typically not basic salary but total target cash compensation, which includes fixed salary but also the 'expected variable compensation'. Deviations from this amount in fact represent the 'real bonus' (positive or negative). We define 'performance' as the factor that explains the variation in this 'real bonus'.

We believe that the validity of pay-for-performance theory eventually boils down to testing this hypothesis. A direct test of the hypothesis is complicated and would need to be based on access to undisclosed legal plan rules for each company.[208] Even if such access would be gained, the

---

[207] Theoretically, one might argue that if an individual would do nothing, this would result in a zero bonus pay-out. Therefore, performance would be the most important determinant of ex post compensation. However, this is a very unlikely situation (first and foremost because such person would be fired).

[208] The difficulty of directly testing this hypothesis relates to the question: how to define performance? Empirical work typically chooses a number of return measures (based on theoretical assumptions) and attempts to find a correlation between pay and these measures of performance. Failing to find a correlation could be the result of the fact that there is no correlation. However, it could also mean that the measures used in practice are not mimicked well enough in empirical research. Companies often use multiple measures for their pay programs and sometimes use company specific definitions (EVA with or without investment relief, EPS diluted or non-diluted, taking into account extraordinary items or not, etc.). This complicates the analysis and basically boils down to entangling the difference between two research questions: 1) which measures are theoretically optimal versus which measures are really used by companies; 2) does pay respond to the measures used in real life? As aforementioned, the latter question

regression results could turn out insignificant given the variety of measures used in practice. In section 4.5 we proposed to follow the indirect route, by confronting CEO data with PCH data. We tested the null hypothesis that the 'real bonus' of the CEO equals the average 'real bonus' for the PCHs, defined in terms of the bonus multipliers. After all, the sum of performance of individual profit centres equals the total performance of the firm, for which the CEO is responsible. If the multiplier for the CEO would be higher, than this is based on factors that are beyond performance (more generally; beyond factors that are similar to the CEO and the full PCH population). This indirectly controls for performance as defined by the company. We were not able to reject the null hypothesis. This finding was supported in two robustness checks. We conclude that the 'real bonus' of the CEO primarily depends on performance. This would imply that other explanations such as managerial power play a subordinate role. However they are still valuable, as they can be used to explain the variation in 'excess remuneration' which we have defined as the difference between the real bonus (multiplier) of the CEO and the average real bonus (multiplier) of the PCHs.

2) Corporate governance & sources of CEO power

Corporate governance matters (Renneboog, 2005). Good governance can limit managerial power to extract excess remuneration. There are external and internal measures of governance. Some examples:

- External: an example of an external measure is the total percentage of block holders. At the PCH level, indeed we observe lower total remuneration levels in the presence of larger block holders (see table 4.10). We also observe a smaller pay gap between CEOs and PCHs if a greater part of the shares are owned by block holders (see table 4.15).
- Internal: an example of an internal measure is the percentage of non-executive directors on the main board (in a one-tier governed company). With regard to the CEO-PCH pay gap, we observe a lower base salary if more directors are non executives (see table 4.16). This could imply that the remuneration package of the CEO has a greater dependence on performance.

In other words, checks and balances are needed to control the power of the CEO. We will now elaborate on the sources of CEO power. In line with Finkelstein (1992) and Grabke-Rundell and Gomez-Meija (2002) we distinguish between four sources of CEO power: structural (proxy: position tenure), expertise (proxy: education), status (proxy: media CEO and cultural differences per country) and ownership (proxy: CEO value and percentage of share ownership). The general view is that sources of power are associated with higher levels of compensation.

---

is difficult to answer given the fact that companies do not typically disclose a lot of detail on the measures they use.

We further refine this view by splitting remuneration in an ex ante and ex post perspective. This can explain in which case we would expect these variables to be sources of managerial power (i.e. sources of remuneration beyond arm's length bargaining). After all, the first mentioned three indicators, can also reveal information on productivity (position tenure and education) or increased risk (media CEO). In these cases we would expect a positively and significant relation between these variables and ex ante remuneration levels, based on human capital theory. A real managerial power variable, thus, should exhibit a positive relationship between ex post remuneration, controlled for the ex ante (human capital) level.

Structural

It seems that position tenure indeed is a managerial power variable. Especially, because it positively and significantly correlates to ex post remuneration levels. In the analysis on the determinants of PCH remuneration, we found a positive correlation between this variable and actual remuneration levels (see table 4.12-B). So called 'excess compensation' for the CEO is furthermore positively and significantly correlated with the positive difference between CEO and PCH tenure (see table 4.20).

Expertise

We find a positive correlation between higher academic titles of the CEO and the ex ante CEO-PCH gap (see table 4.15). This is expected. A higher education typically implies a higher level of human capital. We do not observe a significant correlation with the actual (ex post) pay gap. Academics might be able to negotiate a higher ex ante pay level (from a human capital perspective), but if this is not repaid with performance, the level of education does not provide a source of power to obtain 'excess compensation'.

Status

A similar conclusion can be drawn for the media CEO variable. We observe a significant correlation between media CEOs and policy remuneration levels (see table 4.15 and 4.16). There is no correlation with ex post outcomes. This is in line with the hypothesis that media CEOs demand a higher premium from the perspective of increased reputation risk. There is no evidence to assume that star qualities can be used beyond this, to obtain excess compensation. In contrast, cultural differences that promote power distance can provide the CEO with a position in which he is able to extract rents beyond the specific human capital level and performance. This is particularly observed in Spain. This country is positively correlated with a higher ex post CEO-PCH pay gap at the total target direct compensation level (see table 4.17 and 4.18) as well as with excess remuneration (see table 4.20).

Ownership

When assessing the percentage of share capital owned by the CEO, this seems to be a power variable similar to position tenure. There is no correlation with policy pay levels but there is a link with realised excess pay (table 4.20). However, the coefficient is negative. The CEO with large ownership rights is inclined to give his subordinates a relatively higher bonus multiplier than he claims for himself, in a given year. In other words, he follows the pay-for-performance paradigm stricter for himself than for his direct and indirect reports. Two possible explanations are: i) This is a way to decrease overall bonus payments in the company. Tone at the top in the sense of strict measurement, results in overall lower costs. Through his ownership stake in the company this could be repaid multiple times in comparison to the value of his yearly bonus; ii) Self-dealing with regard to yearly remuneration has less impact than accumulated wealth changes stemming from his equity portfolio. It can even damage his reputation. Retaining and motivating the (right) top team by being 'generous' in relation to his own bonus, could eventually be positively tied to his wealth.

Summary

In summary, the only real 'managerial power' variable in the sense that it is significantly and positively correlated with excess compensation, is position tenure. From this perspective, it makes sense that corporate governance codes typically require limitations on the term in office and provide shareholders with voting rights. For example, the Dutch Corporate Governance Code (2008) in best practice provision II.1.1 states: "A management board member is appointed for a maximum period of four years. A member may be reappointed for a term of not more than four years at a time". Cultures in which power distance is promoted, can also provide the CEO a position to extract rents beyond arm's length bargaining. From the researched countries, this effect is the largest in Spain. This may be the result of a weaker corporate governance climate, and might be a concern for investors.

3) Career concerns – is company loyalty rewarded?

PCHs that are recently hired from outside the company (past 2 years), are correlated with lower base salary increases than insiders. However, from an absolute perspective they earn a higher base salary than insiders.[209] This may be consistent with outside candidates being able to immediately negotiate the higher base salary, whereas insiders grow towards such level over time. It seems that company loyalty is not rewarded, given the negative correlation between company tenure and all definitions of policy pay levels (see table 4.10). A possible explanation

[209] This implies that a greater level of security is needed to persuade an individual to transfer from one company to the other.

would follow the hypothesis that transferable skills are higher priced than company specific skills.

4) Does gender matter?

We observe a negative correlation between the CEO-PCH pay gap in terms of base salary, for female CEOs at the 95^{th} % confidence level and for total target cash compensation at the 90^{th} % confidence level (see table 4.16). Contingent pay is furthermore less likely to be earned by a female CEO. The dummy variable is associated with lower realisations on the actual STI (see table 4.17). Finally, there is support for the hypothesis that a female CEO is associated with negative excess remuneration (see table 4.20). This could imply that male CEOs use their power for the benefit of earning more money, and female CEOs do not. It can also indicate that female CEOs are assessed more strictly in terms of performance, resulting in lower relative pay-outs than her male colleagues in the top team.

5) Industry effects – dynamics in the financial services sector

From the start of the worldwide financial crisis (late 2008), the (remuneration) practices within the financial services sector were heavily scrutinised. Criticism was related to taking excessive risk and being myopic over the period before. Our dataset covers the 9 years preceding the crisis (2000-2008). We found that short-term variable pay as a % of base salary is significantly higher than in other industries (target as well as maximum pay-outs). Furthermore, the defined proxy for 'short-term focus' (STI target divided by LTI expected value) is positively correlated to the financial services sector dummy.[210] The observed practices may signal specific dynamics of the labour market competition in this sector.

6) Country effects – the prince and the pauper revisited

The general notion that 'everything is relative' is emphasised by this research chapter. In the paper of Conyon and Murphy (2000) the U.S. was labelled as 'the prince' and the UK as 'the pauper', given the large positive pay differences in favour of the U.S. In our research for the European market we have observed that the UK is the prince and continental Europe is the pauper. UK PCHs earn (significantly) more than their continental European counterparts in all definitions of policy remuneration.

---

[210] The financial industry dummy was not significant in sections 4.4 and 4.5. This implies that there is no indication that the CEO-PCH gap is larger or smaller (4.4) nor that CEO power is larger in financial companies than in non-financial companies (4.5). Therefore, we have incorporated the non-financial industries for these studies based on the two-digit SIC code classification. We have observed some differences in accent between industries.

7) Time effects – a decade of growing CEO power?

A general tendency of remuneration is that it grows over time. In terms of PCH remuneration we observe a peak in 2007. Starting in the year 2008 we observe a significant decline (in relation to the years before). The start of the financial crisis could be a possible explanation for this. In terms of remuneration structure, we observe a strong increase in the amount of short-term variable remuneration. Approximately 17%-points for 2008 in relation to the 2000 target STI, and 32%-points for maximum STI.

The remuneration gap between the CEO and PCH has also grown over time. This may indicate that over the period 2000-2008, Europe has moved towards a stronger CEO-model in which a greater value is placed on the CEO position in relation to the other members of the top team. An alternative explanation is that the responsibility of CEOs has increased; e.g. due to an increase in the size of firms. This may impact PCHs to a lesser extent given the fact that greater responsibility can be more evenly distributed amongst multiple PCHs.

The above two observations in conjunction, reveal a (time lag) difference between the CEO and PCH position. Where the PCH remuneration declined in 2008, the remuneration of the CEO remained stable or even increased, judging from the increased gap with the PCH. This could be in line with the hypothesis that the start of the financial crisis, has impacted the individuals that (in)directly report to the CEO, faster than it has affected the CEO himself.

4.7 Reference list

Abowd, J..M., (1990), 'Does performance-based Managerial Compensation Affect Corporate Performance?' *Industrial and Labor Relations Review* 43 (3), 52S-73S.

Abowd, J.M, Bognanno, M.L. (1999), 'International Differences in Executive and Managerial Compensation', in R. Freeman, and L. Katz, ed., *Differences and Changes in Wage Structures,* Chicago: The University of Chicago Press, 67-103.

Agarwal, N.C. (1981), 'Determinants of Executive Compensation'. *Industrial Relations* 20, 36-45.

Baker, G.P., Jensen, M.C., Murphy, K.J. (1988), 'Compensation and Incentives: Practice vs. Theory', *Journal of Finance* 43 (3), 593-616.

Balkin, D.G., Gómez-Mejía, L.R. (1987), 'Toward a Contingency Theory of Compensation Strategy', *Strategic Management Journal* 8, pp. 169-182.

Baumol, W. (1959), 'Business Behavior, Value and Growth', New York.

Bebchuk, L.A., Fried, J.M. (2005), 'Pay Without Performance: Overview of the Issues', *Journal of Applied Corporate Finance* 17 (4), 8-23.

Bebchuk, L.A., Fried, J.M., Walker, D.I. (2002), 'Managerial Power and Rent Extraction in the Design of Executive Compensation', *The University of Chicago Law Review* 69:751−846.

Bebchuk, L.A., Cremers, M., Peyer, U. (2007), 'Pay Distribution in the Top Executive Team', *Harvard Law and Economics Discussion Paper No. 574*, 1-57.

Becker, G.S. (1964), 'Human Capital', *National Bureau of Economic Research, New York.*

Beckman, M. (1977), 'Management Production Functions and the Theory of the Firm', *Journal of Economic Theory* 14 (1).

Bertrand, M., Mullanaithan, S. (2001), 'Are CEOs Rewarded for Luck? The Ones without Principals Are', *Quarterly Journal of Economics* 16 (3), 901-932.

Bognanno, M.L. (2001), 'Corporate Tournaments', *Journal of Labor Economics* 19, 290-315.

Borokhovich, K.A., Brunarski, K.R., Parrino, R. (1997), 'CEO Contracting and Anti-Takeover Amendments', *Journal of Finance* 52, 1495-1517.

Boyd, B.K. (1994), 'Board Control and CEO Compensation', *Strategic Management Journal* 15 (5), 335-344.

Bushman, R.M., Indjejikian, R.J., Smith, A. (1995), 'Aggregate Performance Measures in Business Unit Manager Compensation: The Role of Intrafirm Interdependencies', *Journal of Accounting Research* 33, 101-128.

Chandler, A.D. (1962), 'Strategy and Structure: Chapters in the History of the American Industrial Enterprise', *BeardBooks* Washington.

Ciscel, D.H., Carroll, T.M. (1980), 'The Determinants of Executive Salaries: An Econometric Survey', *Review of Economics and Statistics* 62, 7-13.

Ciscel, D.H. (1974), 'Determinants of Executive Compensation', *Southern Economic Journal* 40, 613-617.

Conyon, M.J., Schwalbach, J. (2000), 'Executive Compensation: Evidence from the UK and Germany', *Long Range Planning* 33, 504-526.

Conyon, M.J., Murphy, K.J. (2000), 'The Prince and the Pauper? CEO Pay in the U.S. and the U.K.', *Economic Journal* 110, 640-671.

Conyon, M.J., Peck, S.I., Sadler, G.V. (2001), 'Corporate Tournaments and Executive Compensation: Evidence from the U.K.', *Strategic Management Journal* 22, 805-815.

Core, J., Holthausen, R., Larcker, D. (1999), 'Corporate Governance, Chief Executive Officer Compensation, and Firm Performance', *Journal of Financial Economics* 51, 371-406.

Coughlan, A.T., Schmidt, R.M. (1985), 'Executive Compensation, Management Turnover, and Firm Performance', *Journal of Accounting and Economics* 7 (1-3), 43-66.

Cyert, R., Kang, S., Kumar, P. (2002), 'Corporate Governance, Takeovers, and Top-Management Compensation: Theory and Evidence', *Management Science* 48 (4), 453-469.

Cyert, R., Kang, S., Kumar, P., Shah, A. (1997), 'Corporate Governance and the Level of CEO Compensation', *Working Paper*, Carnegie Mellon University.

Deckop J.R. (1988), 'Determinants of Chief Executive Officer Compensation', *Industrial and Labor Relations Review* 41 (2).

Duffhues, P., Kabir, R. (2008), 'Is the Pay-Performance Relationship Always Positive?: Evidence from The Netherlands', *Journal of Multinational Financial Management* 48 (1), 45-60.

Dyl, E.A. (1988), 'Corporate Control and Management Compensation', *Managerial and Decision Economics* 9, 21-25.

Eriksson, T. (1999), 'Executive Compensation and Tournament Theory: Empirical Tests on Danish Data', *Journal of Labor Economics* 17 (2), 262-280.

Fahlenbrach, R. (2004), 'Shareholder Rights and CEO Compensation', *University of Pennsylvania, Institute for Law & Economics Research Paper.*

Fama, E.F. (1980), 'Agency Problems and the Theory of the Firm', *Journal of Political Economy* 88, 288-307.

Ferrarini, G., Moloney, N., Vespro, C. (2003), 'Executive Remuneration in the EU: Comparative Law and Practice', *ECGI Working Paper Series in Law* June 2003.

Fich, E.L., Shivdasani, A. (2006), 'Are Busy Boards Effective Monitors?', *The Journal of Finance* 61 (2) 689-724.

Finkelstein, S., Hambrick, D.C. (1989), 'Chief Executive Compensation: A Study of the Intersection of Markets and Political Processes', *Strategic Management Journal* 10: 121-134.

Fisher, J., Govindarajan, V. (1992), 'Profit Centre Manager Compensation: An Examination of Market, Political and Human Capital Factors', *Strategic Management Journal* 13, 205-217.

Gibbons, R., Murphy, K.J. (1992), 'Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence', *Journal of Political Economy* 100 (3), 468-505.

Gómez-Mejía, L.R., Tosi, H. Hinkin, T. (1987), 'Managerial Control, Performance, and Executive Compensation', *The Academy of Management Journal* 30 (1), 51-70.

Grabke-Rundell, A., Gómez-Mejía, L.R. (2002), 'Power as a Determinant of Executive Compensation', *Human Resource Management Review* 12 (1), 3-23.

Green, J.R., Stokey, N.L. (1983), 'A Comparison of Tournaments and Contract', *Journal of Labor Economics* 91, 349-364.

Greene, W.H. (2003), 'Econometric Analysis', New York University.

Grinstein, Y., Hribar, P. (2003), 'CEO Compensation and Incentives: Evidence from M&A Bonuses', *Journal of Financial Economics* 78 (1), 119-143.

Hall, B.J., Liebman, J.B. (1998), 'Are CEOs Really Paid Like Bureaucrats?', *Quarterly Journal of Economics* 113 (3), 653-691.

Hartzell, J.C., Starks, L.T. (2003), 'Institutional Investors and Executive Compensation', *The Journal of Finance* 58 (6), 2351-2374.

Heckman, J.J. (1976), 'The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple Estimator for Such Models', *Annals of Economic and Social Measurement* 5 (4), 120-137.

Heckman, J.J. (1979), 'Sample Selection Bias as a Specification Error', *Econometrica* 47 (1), 153-161.

Henderson, A.D., Fredrickson, J.W. (2001), 'Top Management Team Coordination Needs and the CEO Pay Gap: A Competitive Test of the Economic and Behavioral Views', *Academy of Management Journal* 44, 96-117.

Hill, C.W.L., Phan, P. (1991), 'CEO Tenure as a Determinant of CEO Pay', *Academy of Management Journal* 34 (3), 707-717.

Holmstrom, B. (1999), Managerial Incentive Problems: A Dynamic Perspective. *The Review of Economic Studies* 66 (1), 169-182.

Jensen, M.C., Murphy, K.J. (1990), 'Performance Pay and Top-Management Incentives', *Journal of Political Economy* 98, 225-264.

Jensen, M.C., Murphy, K.J. (2010), 'CEO Incentives – It's Not How Much You Pay, But How', Journal of Applied Corporate Finance 22, 64-77.

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

Kraft, K., Niederprüm, A. (1999), 'Determinants of Management Compensation with Risk-Averse Agents and Dispersed Ownership of the Firm', *Journal of Economic Behavior & Organization* 40, 17-27.

Lambert, R.A., Larcker, D.F., Weigelt, K. (1991), 'How Sensitive is Executive Compensation to Organizational Size?', *Strategic Management Journal* 12, 195-402.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (1999), 'Corporate Ownership Around the World', *Journal of Finance* 54, 471-517.

Lazear, E.P., Rosen, S. (1981), 'Rank-Order Tournaments as Optimum Labor Contracts', *Journal of Political Economy* 89, 841-864.

Lazear, E.P. (1995), 'Personnel Economics', Massachusetts Institute of Technology.

Leonard, J.S. (1990), 'Executive Pay and Firm Performance', *Industrial and Labor Relations Review* 43.

Lewellen, W., Huntsman, B. (1970), 'Managerial Pay and Corporate Performance', *American Economic Review* 60 (4), 710-720.

Lewellen, W., Loderer, C., Martin, K. (1985), 'Executive Compensation and Executive Incentive Problems', *Journal of Accounting and Economics* 9, pp. 287-310.

Malmendier, U., Tate, G.A. (2009), 'Superstar CEOs', *Quarterly Journal of Economics* 124, 1593-1638.

Martynova M., Renneboog, L.D.R. (2007), ‘A Corporate Governance Index: Convergence and Diversity of National Corporate Governance Regulations’.

Murphy, K.J., Zábojník, J. (2007), ‘Managerial Capital and the Market for CEOs’, *Working Paper* SSRN 98436.

Murphy, K.J. (1985), ‘Corporate Performance and Managerial Remuneration: An Empirical Analysis’, *Journal of Accounting and Economic* 7, 11-42.

Murphy, K.J. (1998), ‘Executive Compensation’, in Orley Ashenfelter and David Card, Editors, *Handbook of Labor Economics*, volume 3B, Elsevier Science Publishers, 2485-2563.

Murphy, K.J., (2002), ‘Explaining Executive Compensation: Managerial Power vs. the Perceived Cost of Stock Options’, *University of Chicago Law Review* 69, 847–869.

O'Reilly, C.A., Main, B.G., Crystal, G.S. (1988), ‘CEO Compensation as Tournament and Social Comparison: A Tale of Two Theories’, *Administrative Science Quarterly* 33, 257-274.

Ortín-Ángel, P., Salas-Fumás, V. (998), ‘Agency-Theory and Internal-Labor Market Explanations of Bonus Payments: Empirical Evidence from Spanish Firms’, *Journal of Economics & Management Strategy* 7 (4): 573-613.

Oxelheim, L., Randøy, T. (2005), ‘The Anglo-American Financial Influence on CEO Compensation in Non-Anglo-American Firms’, *Journal of International Business Studies* 36 (4): 470-483.

Pfeffer, J. (1994), ‘Managing with Power: Politics and Influence on CEO Compensation in Non-Anglo-American Firms’, *Journal of International Business Studies* 36 (4), 470-483.

Porter, M.E. (1980), ‘Competitive Strategy’, *Free Press, New York.*

Rajgopal, S., Srinivasan, S. (2006), ‘Pay Dispersion in the Executive Suite’, *Working paper*, 1-44.

Renneboog, L.D.R. (2005), ‘Does corporate governance matter?’, *Inaugural lecture*, University of Tilburg, December 2005.

Rosen, S. (1982), ‘Authority, Control, and the Distribution of Earnings’, *The Bell Journal of Economics* 13 (2), 311-323.

Rosen, S. (1986), ‘Prizes and Incentives in Elimination Tournaments’, *American Economic Review* 76, 701-715.

Simon, H.A. (1957), ‘Administrative Behavior’, *Macmillan, New York*.

Snedecor, G.W., Cochran, W.G. (1989), ‘Statistical Methods’, Iowa State University Press.

Tosi, H.L., Gómez-Mejía, L.R. (1989), ‘The Decoupling of CEO Pay and Performance: An Agency Theory Perspective’, *Administrative Science Quarterly* 34, pp. 169-189.

Wilcoxon, F. (1945), ‘Individual Comparison by Ranking Methods’, *Biometrics* 1, 80-83.

Yermack, D. (1996), ‘Higher Market Valuation for Firms with a Small Board of Directors’, *Journal of Financial Economics* 40, 185-211.

Appendix 4.1: Overview research variables

Below, explanations and sources of the research variables are presented in alphabetical order. Subsequently, a list of the meaning of abbreviations is shown.

Variable name	Description and source	Section
Age	Equals the age of the PCH in years. *Source:* Towers Perrin survey 2000-2008, Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.2, 4.3
Age difference	Represents the difference in age between the CEO and a PCH of the same company.	4.4, 4.5
Annualised Expected Long-Term Incentive (LTI) %	Reflects the value of long-term incentive awards (cash, shares and options), according to the valuation techniques used in the Top Executive Remuneration Survey, expressed as a percentage of base salary. For example: the annualised expected value of options is calculated with a binomial tree (lattice model). *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2
Annualised Expected Long-Term Incentive (LTI) Value	Reflects the value of long-term incentive awards (cash, shares and options), according to the valuation techniques used in the Top Executive Remuneration Survey, expressed in EUR. For example: the annualised expected value of options is calculated with a binomial tree (lattice model). *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2
Base salary	Equals all fixed components including elements such as vacation allowance. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2-4.5
Base salary increase	Equals the percentage increase in base salary between t and t-1. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2, 4.3
Block holders total %	A block holder is defined as a shareholder that owns at least a certain minimum percentage of the total share capital of a company (typically 3% or 5%). This variable represents the total percentage of the share capital of company which is owned by block holders. It is measured per the end of the research period and used as a proxy for the preceding years as well.	4.3-4.5
Block holder % (type)	Represents the type of the largest block holder, and the percentage of the total share capital of the company owned by this party. We	4.3-4.5

Variable name	Description and source	Section
	distinguish the following types of block holders: - Block holder % (insurance company); - Block holder % (bank); - Block holder % (industrial company); - Block holder % (nominee/trust); - Block holder % (financial company); - Block holder % (individual/family); - Block holder % (foundation); - Block holder % (employees/managers/directors); - Block holder % (private equity); - Block holder % (state). For the sake of completeness, we have controlled the regression analyses for categories "public", "unnamed private shareholders aggregated" and "other unnamed shareholders". Amadeus/REACH argues that these categories of block holders are unable to exert control over a company. Therefore, they are not reflected in the overview tables. *Source*: Amadeus/REACH.	
Capital expenditure % of sales	Equals the amount of capital expenditures as a percentage of sales ((Capital Expenditures / Sales) * 100). *Source*: Capital IQ Database	4.3-4.5
CEO externally hired recently	Dummy variable which equals 1 if CEO is externally hired between t and t-2, and 0 otherwise. *Source*: Towers Perrin survey 2000-2008, Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.5
CEO share percentage owned	Represents the number of shares owned by the CEO as a percentage of the total outstanding shares of the company. *Source*: Annual Reports, Worldscope.	4.4, 4.5
CEO share value owned	Represents the value of the shares owned by the CEO (number of shares * share price). *Source*: Annual Reports, DataStream.	4.4, 4.5
Company age	Equals the age of the company measured in terms of the number of years since the year of incorporation. *Source*: Amadeus/REACH, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.3-4.5
Company sales	Equals total sales/revenues of the company in year t in millions. *Source*: Towers Perrin survey 2000-2008, Amadeus/REACH, Annual Reports.	4.2
Company tenure	Equals the time the CEO or PCH has been employed within the company in years. *Source*: Towers Perrin survey 2000-2008,	4.2, 4.3

Variable name	Description and source	Section
	Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	
Company tenure difference	Equals the difference in number of years of company tenure between the CEO and a PCH of the same company.	4.4, 4.5
Country dummy	Dummy variable where The Netherlands is taken as the basis. Nine dummies are created for: - Austria; - Belgium; - Spain; - France: - Germany; - Italy; - Sweden; - Switzerland; - United Kingdom.	4.3-4.5
Diversification level (conglomerate)	Categories variable which represents the extent to which a firm has diversified operations: - 0 equals: the company has only one SIC code; - 1 equals: the company has more than one SIC code, but the SIC codes do not differ at the first digit; - 2 equals: the company has more than one SIC code, and the SIC codes do differ at the first digit. *Source*: Amadeus/REACH, Worldscope.	4.3-4.5
Dummy CEO = Chair	Dummy variable which equals 1 if the CEO also holds the Chairman position, and 0 otherwise. *Source*: Annual Reports.	4.4, 4.5
Dummy education (PhD, Prof.)	Dummy variable which equals 1 if the CEO is a PhD or Professor, and 0 otherwise. *Source*: Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.4, 4.5
Dummy externally hired recently	Dummy variable which equals 1 if CEO or PCH is externally hired between t and t-2, and 0 otherwise. *Source*: Towers Perrin survey 2000-2008, Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.3
Dummy female CEO	Dummy variable which equals 1 in case of a female CEO, and 0 in case of a male CEO. *Source*: Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.4, 4.5

Variable name	Description and source	Section
Dummy financial company	Represents a company with a primary SIC code of which the first digit is a 6. *Source*: Amadeus/REACH, Worldscope.	4.3
Dummy presence rem. advisor	Dummy variable which equals 1 if the company makes use of an external remuneration advisor and has published this, and 0 otherwise. *Source*: Annual Reports, corporate websites.	4.4, 4.5
Dummy presence rem. comm.	Dummy variable which equals 1 if the company operates a remuneration committee and has published this, and 0 otherwise. *Source*: Annual Reports, corporate websites.	4.4, 4.5
Dummy remuneration advisor	Represents the case when a company makes use of an external remuneration advisor and has published the name of the advisor. If multiple advisors are used, this results in multiple dummies being recorded as 1. The five largest advisors were used: -Towers Perrin; - Mercer; - NBS (New Bridge Street); - Kepler; - Monks Partnership. *Source*: Annual Reports.	4.4, 4.5
Externally hired recently difference	Categories variable which: - Equals 1 if the CEO is externally hired recently and the PCH of the same company is not; - Equals 0 if both the CEO and the PCH of the same company are externally hired recently, or if both the CEO and the PCH of the same company are not externally hired recently; - Equals -1 if the CEO is not externally hired recently, and the PCH of the same company is externally hired recently.	4.4, 4.5
Financial paper (control)	Equals the percentrank per year of the number times the name of a CEO appears in a country's financial newspaper in combination with the name of the company. For an overview of financial newspapers used, please refer to table 4.14. *Source*: Lexis Nexis Database.	4.4, 4.5
Firm performance	Represents the performance of the firm, measured by: - Liquidity ratio: (Current Assets – Inventory) / Current Liabilities. *Source*: Amadeus/REACH. - Gearing ratio: ((Non-Current Liabilities + Loans) / Equity) * 100. *Source*: Amadeus/REACH. - ROCE (Return on Capital Employed): (Profit before Taxation /	4.3-4.5

Variable name	Description and source	Section
	Equity) * 100. *Source*: Amadeus/REACH. - Profit margin: (Profit before Taxation / Operating Revenue). *Source*: Amadeus/REACH. - Interest coverage: Operating Profit / Interest Paid. *Source*: Amadeus/REACH. - Tobin's Q (market-to-book): As a proxy for Tobin's Q the Market-to-Book ratio is used: (Market Capitalisation / Book Value of Equity). *Source*: DataStream, Capital IQ Database. - Solvency ratio: (Shareholder funds / Total Assets) * 100. *Source*: Amadeus/REACH.	
Firm risk	Volatility: 1-year volatility of the company's share price. *Source*: DataStream.	
Firm size	Reflects the size of the firm in terms of company assets, and company employees: - Company assets: Equals total assets of the company in year t in millions (ln). *Source*: Towers Perrin survey 2000-2008, Amadeus/REACH, Annual Reports. - Company employees: Equals the total number of employees of the company. *Source*: Towers Perrin survey 2000-2008, Amadeus/REACH, Annual Reports.	4.2-4.5
Governance (dummy two-tier board)	Dummy variable which equals 0 if the company operates a one-tier board structure, and equals 1 if the company operates a two-tier board structure. *Source*: Annual Reports.	4.3, 4.4
International scope	Dummy variable which represents the extent to which a CEO or PCH is operating internationally: - Equals 0 in case of single-country responsibility; - Equals 1 in case of multi-country responsibility; - Equals 2 in case of single-region responsibility; - Equals 3 in case of multi-region or worldwide responsibility. *Source*: Towers Perrin survey 2000-2008.	4.3
International scope difference	Represents the difference in the international scope of operations between the CEO and a PCH of the same company. International scope per position is measured on a scale of 0 to 3. *Source:* Towers Perrin survey 2000-2008.	4.4, 4.5
IPO age	Category variable which represents the number of year since the firm's IPO: 0 equals: the firm is not listed; 1 equals: IPO in the current year; 2 equals: IPO 1 year ago; 3 equals: IPO 2 years ago; 4	4.3-4.5

Variable name	Description and source	Section
	equals: IPO 3 years ago; 5 equals: IPO 4 years ago; 6 equals: IPO 5-10 years ago; 7 equals: IPO 10-20 years ago; 8 equals: IPO over 20 years ago. *Source*: Amadeus/REACH, DataStream, financial websites (e.g. Bloomberg Business Week and Yahoo Finance), Annual Reports.	
Large paper (control)	Equals the percentrank per year, per country of the number of times the name of a CEO appears in a country's largest daily newspaper / weekly magazine in combination with the name of the company. For an overview of newspapers used, please refer to table 4.14. *Source*: Lexis Nexis Database.	4.4, 4.5
Media CEO	Equals the percentrank per year of the total number of hits the name of a CEO in combination with the name of the company are generated by the Lexis Nexis Database. *Source*: Lexis Nexis Database.	4.4, 4.5
NED percentage on main board	Equals the number of non-executive directors as a percentage of the total number of positions on the main board (For this variable a 0 is recorded in case of a two-tier board structured company.). *Source*: Annual Reports, corporate websites.	4.4, 4.5
New CEO year	Dummy variable which equals 1 if there is a change of CEO in the respective year, and 0 otherwise. *Source*: Towers Perrin survey 2000-2008, Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.4, 4.5
Number of PCHs	Equals the number of profit centre heads in the database in year t. *Source*: Towers Perrin survey 2000-2008.	4.5
PC relative size	Reflects the relative responsibility for the total company. - The CEO is responsible for the entire company: responsibility is always 100%; - A PCH is typically responsible for part of the company. This responsibility is measured by: PCH span of control divided by company total employees; if not available; Profit centre sales divided by company total sales. *Source*: Towers Perrin survey 2000-2008.	4.2, 4.3
Position tenure	Equals the time the CEO or PCH has been in the current position measured in years. *Source*: Towers Perrin survey 2000-2008, Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.2, 4.3

Variable name	Description and source	Section
Position tenure difference	Equals the difference in number of years of position tenure between the CEO and a PCH of the same company.	4.4, 4.5
Previous CEO	Dummy variable which equals 1 if a CEO already employed a CEO-position previously in another company and 0 otherwise. *Source*: Annual Reports, corporate websites, financial websites (e.g. Bloomberg Business Week, Yahoo Finance).	4.4, 4.5
Reporting level	Equals 1 for a CEO; 2 for a PCH who is part of the executive board and reports directly to the CEO; 3 for a PCH who is not part of the executive board and does not report directly to the CEO. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.3
Reporting level difference	Equals the difference in reporting level between the CEO and a PCH of the same company.	4.4, 4.5
Sales difference	Equals the difference in corporate sales (for the CEO position) and profit centre sales (for a PCH position) of the same company. *Source*: Towers Perrin survey 2000-2008, Worldscope.	4.4, 4.5
Short-Term Incentive (STI) %	Equals the actual amount of short-term incentive earned in the most recent bonus cycle as a percentage of base salary. *Source*: Towers Perrin survey 2000-2008.	4.2
Short-Term Incentive (STI) Target %	Expressed as a percentage of base salary: is reflective of individual incentive and bonus awards in the most recent bonus cycle for normal, expected or on target performance. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2
Short-Term Incentive (STI) Target value	Equals base salary * STI target %. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2
Short-Term Incentive (STI) Value	Equals the actual amount earned in the most recent bonus cycle. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2-4.4
Size of the main board	Equals the number of positions in the “main board” (one-tier Board, and two-tier Executive Board). *Source*: Annual Reports, corporate websites.	4.4
Size of the supervisory board (section 4.4):	Equals the number of positions in the supervisory board (a 0 is recorded in case of a one-tier board structured companies). *Source*: Annual Reports, corporate websites.	4.4
Span of control	Equals the number of employees who are subordinate to the CEO or PCH. *Source*: Towers Perrin survey 2000-2008.	4.3, 4.3
Span of control	Equals the difference in the number of subordinates of the CEO	4.4, 4.5

Variable name	Description and source	Section
difference	and a PCH of the same company.	
Total Cash	Equals the sum of base salary and STI value. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2-4.4
Time dummy	Dummy variable where the year 2000 is taken as basis. 8 dummies are created for the years 2001 – 2008.	4.3-4.5
Total Target Cash	Equals the sum of base salary and STI target value. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2-4.4
Total Target Direct Compensation	Equals the sum of base salary, STI target value and the annualised expected LTI. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2-4.4
Total Target Variable %	Equals the sum of the target short-term incentive and the annualised expected long-term incentive as a percentage of base salary. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2
Total Variable %	Equals the sum of the short-term incentive value and the annualised expected long-term incentive as a percentage of base salary. *Source*: Towers Perrin survey 2000-2008, Annual Reports.	4.2
Variation coefficient and standard deviation	Measure the variance in actual pay-out as a percentage of target pay-out for the PCH, and therefore a proxy of the variation in performance of the profit centres.	4.5

List of abbreviations

CEO	Chief Executive Officer	OLS	Ordinary Least Squares
CHF	Swiss Franc	PC	Profit Centre
EPS	Earnings Per Share	PCH	Profit Centre Head
EUR	Euro	SD	Standard Deviation
EVA	Economic Value Added	SEK	Swedish Krona
GBP	British Pound	SIC	Standard Industrial Classification
IPO	Initial Public Offering	STI(P)	Short-Term Incentive (Plan)
JPY	Japanese yen	TC	Total Cash
ln	Natural logarithm	TDC	Total Direct Compensation
LN	Lexis Nexis database	TTC	Total Target Cash
LTI(P)	Long-Term Incentive (Plan)	TTDC	Total Target Direct Compensation
NED	Non-Executive Director	USD	United States Dollar
N.S.S.	Not Statistically Significant	VIF	Variance inflation factor

Appendix 4.2: CEO position summary tables per year (2000-2008)

Chief Executive Officer	year	N	p5	p25	p50	mean	p75	p95
Base salary	2000	109	408402	669966	839284	870126	1037824	1407830
Base increase %	2000	81	0	4	8	11	15	32
STI target value	2000	73	90756	208738	305029	389896	505060	1029701
STI target %	2000	73	15	25	35	43	50	75
STI max %	2000	87	30	50	60	74	100	140
STI value	2000	93	0	144393	333241	399663	557718	979475
STI %	2000	93	0	21	37	47	60	129
LTI value	2000	63	64247	169487	311099	523669	708357	1517632
LTI %	2000	63	8	23	34	55	69	127
Total target variable %	2000	46	33	54	83	87	107	172
Total variable %	2000	57	27	55	74	96	110	240
Total Target Cash	2000	109	476469	767088	1030964	1131250	1372635	2260651
Total Cash	2000	109	538863	836251	1156138	1222528	1490857	2310287
Total Target Direct Compensation	2000	63	726317	1121014	1482072	1790043	2104302	3602378
Total Direct Compensation	2000	63	662073	1189958	1634936	1850618	2295603	3602378
Age of individual	2000	136	44	51	53	53	57	61
Tenure position (years)	2000	138	0	1	3	4	5	13
Tenure company (years)	2000	139	1	4	13	14	22	36
Span of control (# of employees)	2000	138	4915	13561	31134	52595	75200	166114
Company total employees	2000	138	4915	13561	31134	52595	75200	166114
Company total assets (* 1 mln)	2000	129	491	3309	9631	60529	35556	435599
Company total sales (* 1mln)	2000	128	790	2906	6702	16428	19002	56751
Responsibility (relative size PC)	2000	140	100	100	100	100	100	100
Base salary	2001	146	396683	627236	884406	886013	1082948	1480027
Base increase %	2001	100	0	5	8	11	14	27
STI target value	2001	99	64435	210146	328493	433762	595619	1110019
STI target %	2001	99	7	30	40	4875758	60	100
STI max %	2001	111	40	50	60	8342342	100	200
STI value	2001	127	0	195000	343729	488905	708877	1263439
STI %	2001	127	0	28	42	57	73	132
LTI value	2001	135	0	0	271597	554765	727289	1855333
LTI %	2001	135	0	0	29	61	80	179
Total target variable %	2001	98	20	42	78	102	115	227
Total variable %	2001	118	6	44	89	1170424	159	294
Total Target Cash	2001	146	447144	762350	1035118	1180140	1443930	2225070
Total Cash	2001	146	530922	870895	1129874	1318080	1658263	2590049
Total Target Direct Compensation	2001	135	447144	1036070	1516125	1752966	2171218	3608364
Total Direct Compensation	2001	135	510271	1007994	1469441	1868189	2285787	4095720
Age of individual	2001	164	45	50	54	54	58	61
Tenure position (years)	2001	170	0	1	3	4	6	15
Tenure company (years)	2001	171	1	5	13	15	26	36
Span of control (# of employees)	2001	177	2332	12100	29606	53512	76630	188050
Company total employees	2001	177	2332	12100	29606	53512	76630	188050

Chief Executive Officer	year	N	p5	p25	p50	mean	p75	p95
Company total assets (* 1 mln)	2001	172	473	2844	9712	56244	32406	465486
Company total sales (* 1mln)	2001	171	695	2475	6766	16592	20683	54213
Responsibility (relative size PC)	2001	180	100	100	100	100	100	100
Base salary	2002	184	347000	604653	885056	898003	1105509	1500000
Base increase %	2002	126	0	2	5	8	10	21
STI target value	2002	127	130239	264550	426653	530514	649767	1511116
STI target %	2002	127	23	32	50	57	70	120
STI max %	2002	135	45	50	80	90	100	200
STI value	2002	162	0	122734	327689	526075	727380	1834246
STI %	2002	162	0	17	42	65	82	144
LTI value	2002	164	0	66800	342000	733670	818207	2400843
LTI %	2002	164	0	14	47	72	96	235
Total target variable %	2002	126	25	61	101	123	153	275
Total variable %	2002	144	14	49	96	125	158	333
Total Target Cash	2002	184	448344	748500	1100742	1264173	1587870	2517182
Total Cash	2002	184	450000	812726	1112734	1382493	1710736	3042446
Total Target Direct Compensation	2002	164	514362	1017688	1643210	2026143	2365910	4635177
Total Direct Compensation	2002	164	542669	999407	1656146	2071224	2553468	4393822
Age of individual	2002	208	42	51	55	54	58	62
Tenure position (years)	2002	207	0	1	3	4	6	11
Tenure company (years)	2002	204	1	5	13	16	27	36
Span of control (# of employees)	2002	225	1805	10013	25554	49978.12	69400	177000
Company total employees	2002	225	1805	10013	25554	49978.12	69400	177000
Company total assets (* 1 mln)	2002	217	463	2621	8544	56605.75	30148	376747
Company total sales (* 1mln)	2002	215	487	2183	6154	15410.35	18280	53689
Responsibility (relative size PC)	2002	232	100	100	100	100	100	100
Base salary	2003	236	408000	626508	902842	918271	1143059	1534175
Base increase %	2003	152	0	0	6	8	12	25
STI target value	2003	198	138978	252686	401592	540962	667057	1425879
STI target %	2003	198	22	30	50	5641919	67	100
STI max %	2003	179	50	60	80	97	100	200
STI value	2003	198	0	225000	408053	587394	736404	1950000
STI %	2003	198	0	30	51	61	81	150
LTI value	2003	213	0	0	283522	793767	789449	2863800
LTI %	2003	213	0	0	36	77	83	249
Total target variable %	2003	194	25	50	86	122	132	300
Total variable %	2003	176	11	51	89	124	143	343
Total Target Cash	2003	236	475111	843596	1225986	1372130	1738650	2637044
Total Cash	2003	236	487085	870798	1188029	1427913	1814839	3113500
Total Target Direct Compensation	2003	213	625000	1079810	1718275	2202325	2616151	4675148
Total Direct Compensation	2003	213	603082	1048169	1630015	2224011	2704107	5179827
Age of individual	2003	243	43	50	55	54	58	63
Tenure position (years)	2003	251	0	1	3	4	5	11
Tenure company (years)	2003	247	0	4	10	14	23	35
Span of control (# of employees)	2003	291	1545	9000	25567	47674	66400	163694

Chief Executive Officer	year	N	p5	p25	p50	mean	p75	p95
Company total employees	2003	291	1545	9000	25567	47674	66400	163694
Company total assets (* 1 mln)	2003	283	582	2417	8240	55258	37968	300548
Company total sales (* 1mln)	2003	283	495	2116	5970	15419	17553	50025
Responsibility (relative size PC)	2003	296	100	100	100	100	100	100
Base salary	2004	243	365000	599115	902457	944470	1227454	1606372
Base increase %	2004	165	0	0	4	5	8	15
STI target value	2004	202	117468	257180	475007	620816	717452	1710333
STI target %	2004	202	25	37	50	63	75	148
STI max %	2004	187	50	63	100	103	120	200
STI value	2004	222	0	194834	453033	684897.3	920505	2195856
STI %	2004	222	0	29	52	69	91	187
LTI value	2004	207	0	246117	604554	1117495	1183425	3909305
LTI %	2004	207	0	33	61	101	116	433
Total target variable %	2004	185	43	82	120	155	180	457
Total variable %	2004	188	36	75	121	172	202	582
Total Target Cash	2004	243	483869	847528	1295024	1460540	1845934	3197581
Total Cash	2004	243	467602	827428	1350530	1587465	1992072	3510173
Total Target Direct Compensation	2004	207	647157	1254060	2091386	2671134	3232178	7205390
Total Direct Compensation	2004	207	643500	1221292	2204842	2746624	3220052	7046365
Age of individual	2004	272	44	51	55	54	58	63
Tenure position (years)	2004	271	0	1	3	4	5	12
Tenure company (years)	2004	272	1	3	10	13	21	35
Span of control (# of employees)	2004	306	1031	8741	24264	43890	61732	161310
Company total employees	2004	306	1031	8741	24264	43890	61732	161310
Company total assets (* 1 mln)	2004	299	503	2362	8043	60523	36835	417148
Company total sales (* 1mln)	2004	297	262	2173	5685	15311	16262	59773
Responsibility (relative size PC)	2004	314	100	100	100	100	100	100
Base salary	2005	284	347484	588251	873386	948465	1260521	1876285
Base increase %	2005	190	0	0	4	6	7	16
STI target value	2005	241	70200	265000	468000	677981	844992	1880344
STI target %	2005	241	20	40	50	66	90	131
STI max %	2005	220	40	75	100	115	150	233
STI value	2005	241	0	284273	639841	827202	1171270	2517184
STI %	2005	241	0	41	70	88	112	208
LTI value	2005	242	0	196930	574571	1187958	1303866	4527327
LTI %	2005	242	0	27	63	111	117	342
Total target variable %	2005	221	35	83	130	172	197	412
Total variable %	2005	206	27	78	134	197	226	496
Total Target Cash	2005	284	481504	810886	1257280	1523794	1966748	3514162
Total Cash	2005	284	491722	896652	1354640	1671720	2141123	3913486
Total Target Direct Compensation	2005	242	579190	1220588	2081606	2766229	3311848	7047409
Total Direct Compensation	2005	242	546911	1195161	2127217	2851072	3603582	7552700
Age of individual	2005	310	44	49	54	54	58	63
Tenure position (years)	2005	305	0	1	3	4	6	11
Tenure company (years)	2005	310	1	3	10	13	22	36

Chief Executive Officer	year	N	p5	p25	p50	mean	p75	p95
Span of control (# of employees)	2005	344	881	7044	21843	45087	64102	167801
Company total employees	2005	344	881	7044	21843	45087	64102	167801
Company total assets (* 1 mln)	2005	340	311	2240	7165	70939	30106	383392
Company total sales (* 1mln)	2005	339	257	1924	5595	16056	16528	61303
Responsibility (relative size PC)	2005	356	100	100	100	100	100	100
Base salary	2006	276	353460	631056	901853	985101	1263439	1850035
Base increase %	2006	186	0	0	4	5	8	23
STI target value	2006	228	123711	336900	623415	801341	1000321	2165892
STI target %	2006	228	30	50	62	75	100	140
STI max %	2006	221	50	75	100	122	150	250
STI value	2006	252	75000	252682	691128	968535	1256085	3282683
STI %	2006	252	11	40	75	89	120	206
LTI value	2006	234	0	200092	540868	1000127	1057498	3647779
LTI %	2006	234	0	27	60	90	101	243
Total target variable %	2006	211	40	91	126	160	196	427
Total variable %	2006	212	34	81	135	179	224	439
Total Target Cash	2006	276	464100	836450	1416154	1647079	2078948	4000000
Total Cash	2006	276	492561	911481	1478517	1888391	2313148	5049051
Total Target Direct Compensation	2006	234	570000	1214367	2045000	2697890	3253711	7081771
Total Direct Compensation	2006	234	560148	1202307	2116152	2844282	3337881	7612030
Age of individual	2006	310	42	49	54	53	58	63
Tenure position (years)	2006	306	0	2	3	4	6	12
Tenure company (years)	2006	311	1	3	9	13	21	36
Span of control (# of employees)	2006	330	692	6689	19627	45426	61900	164078
Company total employees	2006	330	692	6689	19627	45426	61900	164078
Company total assets (* 1 mln)	2006	325	381	2461	8021	78088	32190	512185
Company total sales (* 1mln)	2006	325	288	1867	5802	16202	14509	66152
Responsibility (relative size PC)	2006	338	100	100	100	100	100	100
Base salary	2007	281	350000	600000	825000	939386	1186378	1850000
Base increase %	2007	171	0	0	5	7	9	20
STI target value	2007	231	119800	333933	627251	795893	1028230	2058769
STI target %	2007	231	25	50	75	80	100	150
STI max %	2007	218	50	90	120	135	170	250
STI value	2007	256	0	378146	689833	986559	1375000	3240000
STI %	2007	256	0	54	86	99	122	240
LTI value	2007	233	0	215129	663408	1231638	1388625	3716882
LTI %	2007	233	0	36	74	112	128	311
Total target variable %	2007	215	39	98	153	191	225	452
Total variable %	2007	214	40	100	169	210	257	490
Total Target Cash	2007	281	448000	817311	1345078	1593662	2050303	3825000
Total Cash	2007	281	500000	938644	1496937	1852906	2322467	4533143
Total Target Direct Compensation	2007	233	570000	1189395	2254201	2871813	3508001	6827439
Total Direct Compensation	2007	233	540000	1292799	2252450	3021545	3601210	6983718
Age of individual	2007	302	41	48	53	53	58	63
Tenure position (years)	2007	294	0	1	3	4	6	11

Chief Executive Officer	year	N	p5	p25	p50	mean	p75	p95
Tenure company (years)	2007	302	1	4	9	13	20	36
Span of control (# of employees)	2007	330	700	7097	20738	47270	62009	175000
Company total employees	2007	330	700	7097	20738	47270	62009	175000
Company total assets (* 1 mln)	2007	324	349	2690	9354	94953	34646	497679
Company total sales (* 1mln)	2007	324	217	2171	6016	19768	16282	72448
Responsibility (relative size PC)	2007	336	100	100	100	100	100	100
Base salary	2008	259	362000	650000	906210	1015211	1250000	1980000
Base increase %	2008	153	0	2	5	8	8	18
STI target value	2008	204	148750	450000	751497	948446	1129461	2349266
STI target %	2008	204	35	58	80	87	100	150
STI max %	2008	193	50	100	142	147	180	250
STI value	2008	235	0	393988	800000	1122652	1598554	3229350
STI %	2008	235	0	57	93	104	137	216
LTI value	2008	219	0	204532	698553	1224934	1479742	3394007
LTI %	2008	219	0	33	78	103	128	257
Total target variable %	2008	192	54	115	156	198	243	422
Total variable %	2008	200	52	109	179	213	273	474
Total Target Cash	2008	259	450000	920000	1545000	1762250	2125920	3925130
Total Cash	2008	259	484507	1030000	1637696	2046375	2678940	4617801
Total Target Direct Compensation	2008	219	583071	1295531	2372332	3040856	3846582	7084584
Total Direct Compensation	2008	219	580781	1434676	2453182	3215268	3954903	7175448
Age of individual	2008	197	42	49	54	54	60	65
Tenure position (years)	2008	274	0	2	4	5	6	14
Tenure company (years)	2008	275	1	4	8	13	20	35
Span of control (# of employees)	2008	308	750	6253	20839	51236	67554	186049
Company total employees	2008	308	750	6253	20839	51236	67554	186049
Company total assets (* 1 mln)	2008	302	367	2947	9612	109227	42893	647027
Company total sales (* 1mln)	2008	298	306	2128	6088	22958	19019	81334
Responsibility (relative size PC)	2008	321	100	100	100	100	100	100

Appendix 4.3: PCH position summary tables per year (2000-2008)

Profit Centre Head	year	N	p5	p25	p50	mean	p75	p95
Base salary	2000	477	156099	231325	324884	352798	451228	631719
Base increase %	2000	288	0	4	7	9	13	25
STI target value	2000	375	25223	56853	100616	124377	164246	300065
STI target %	2000	375	13	25	30	34	40	65
STI max %	2000	399	30	40	50	58	70	100
STI value	2000	406	0	45510	99930	135707	176974	377558
STI %	2000	406	0	19	32	36	46	91
LTI value	2000	330	18037	75874	159726	278171	301800	917794
LTI %	2000	330	6	25	47	78	89	236
Total target variable %	2000	260	27	56	84	114	129	250
Total variable %	2000	284	33	55	89	120	139	293
Total Target Cash	2000	477	176429	283741	411612	450579	569450	856430
Total Cash	2000	477	163885	292828	417164	474126	599030	914999
Total Target Direct Compensation	2000	330	230255	386222	614699	739606	894661	1735031
Total Direct Compensation	2000	330	219534	409251	626082	767448	937623	1869870
Age of individual	2000	358	38	45	50	49	53	58
Tenure position (years)	2000	366	0	1	2	3	3	8
Tenure company (years)	2000	370	1	4	11	14	22	32
Span of control (# of employees)	2000	404	200	1586	4366	10742	11774	44246
Company total employees	2000	138	4915	13561	31134	52595	75200	166114
Company total assets (* 1 mln)	2000	129	491	3309	9631	60529	35556	435599
Company total sales (* 1mln)	2000	128	790	2906	6702	16428	19002	56751
Responsibility (relative size PC)	2000	382	1	7	16	25	32	95
Base salary	2001	820	114859	185003	268615	313372	397081	649884
Base increase %	2001	413	2	4	6	9	10	25
STI target value	2001	612	17885	50630	89929	123880	167407	335712
STI target %	2001	612	12	25	30	36	50	67
STI max %	2001	656	30	40	50	61	75	100
STI value	2001	738	3607	40941	79302	126769	163818	394570
STI %	2001	738	2	21	32	37	48	83
LTI value	2001	820	0	0	88844	206797	271600	725600
LTI %	2001	820	0	0	33	61	76	193
Total target variable %	2001	612	15	37	72	100	121	232
Total variable %	2001	738	10	38	73	100	125	253
Total Target Cash	2001	820	130131	228291	328309	405829	523863	870000
Total Cash	2001	820	136622	237128	360457	433947	534852	935602
Total Target Direct Compensation	2001	820	132462	283749	458536	612627	786269	1494175
Total Direct Compensation	2001	820	140250	291521	493844	640744	811056	1561173
Age of individual	2001	474	38	45	49	49	54	59
Tenure position (years)	2001	515	0	1	2	3	3	9
Tenure company (years)	2001	521	1	4	12	14	23	32
Span of control (# of employees)	2001	625	65	740	2600	7710	6900	30000

Profit Centre Head	year	N	p5	p25	p50	mean	p75	p95
Company total employees	2001	177	2332	12100	29606	53512	76630	188050
Company total assets (* 1 mln)	2001	172	473	2844	9712	56244	32406	465486
Company total sales (* 1mln)	2001	171	695	2475	6766	16592	20683	54213
Responsibility (relative size PC)	2001	556	0	2	8	14	19	50
Base salary	2002	1291	117365	173278	243918	297219	368900	635292
Base increase %	2002	831	0	3	5	7	9	19
STI target value	2002	1007	25835	51891	91599	132067	169661	374130
STI target %	2002	1007	15	25	37	40	50	83
STI max %	2002	1081	27	45	60	67	80	150
STI value	2002	1177	0	34294	75005	130450	152856	459537
STI %	2002	1177	0	17	32	40	50	110
LTI value	2002	1291	0	0	67228	153705	184700	602200
LTI %	2002	1291	0	0	28	45	61	150
Total target variable %	2002	1007	20	40	64	84	109	197
Total variable %	2002	1177	12	36	65	86	115	214
Total Target Cash	2002	1291	139034	216364	315859	400233	495000	914367
Total Cash	2002	1291	140162	223500	323104	424478	536171	1036020
Total Target Direct Compensation	2002	1291	154813	259194	410741	553939	688907	1403675
Total Direct Compensation	2002	1291	160991	266196	428596	578184	714991	1470677
Age of individual	2002	769	38	45	50	49	55	59
Tenure position (years)	2002	693	1	1	2	3	3	9
Tenure company (years)	2002	680	1	5	14	16	26	37
Span of control (# of employees)	2002	684	7	103	1029	5076	4260	16983
Company total employees	2002	225	1805	10013	25554	49978.12	69400	177000
Company total assets (* 1 mln)	2002	217	463	2621	8544	56605.75	30148	376747
Company total sales (* 1mln)	2002	215	487	2183	6154	15410.35	18280	53689
Responsibility (relative size PC)	2002	1087	0	1	6	17	22	84
Base salary	2003	1606	110004	165000	240000	292573	370006	645920
Base increase %	2003	1196	0	2	5	6	8	17
STI target value	2003	1534	21247	47993	85957	128572	161000	382800
STI target %	2003	1534	15	25	35	40	50	81
STI max %	2003	1348	26	45	60	68	80	144
STI value	2003	1458	0	38054	74832	128814	155223	432000
STI %	2003	1458	0	21	34	41	50	99
LTI value	2003	1606	0	0	54100	124989	133200	439593
LTI %	2003	1606	0	0	23	46	52	123
Total target variable %	2003	1534	20	39	60	75	102	167
Total variable %	2003	1458	12	35	62	88	105	187
Total Target Cash	2003	1606	135008	216589	330507	415381	521167	999018
Total Cash	2003	1606	135369	214276	324884	416771	507179	1037824
Total Target Direct Compensation	2003	1606	158016	262503	394917	540371	662019	1408797
Total Direct Compensation	2003	1606	152119	257070	392308	541760	651212	1424797
Age of individual	2003	863	38	44	49	49	55	60
Tenure position (years)	2003	830	0	1	2	3	4	8
Tenure company (years)	2003	847	1	5	14	15	24	35

Profit Centre Head	year	N	p5	p25	p50	mean	p75	p95
Span of control (# of employees)	2003	787	6	160	1250	5155	4500	21130
Company total employees	2003	291	1545	9000	25567	47674	66400	163694
Company total assets (* 1 mln)	2003	283	582	2417	8240	55258	37968	300548
Company total sales (* 1mln)	2003	283	495	2116	5970	15419	17553	50025
Responsibility (relative size PC)	2003	1322	0	2	8	19	23	92
Base salary	2004	1870	114452	167812	243032	299068	380000	658795
Base increase %	2004	1339	0	2	4	6	7	17
STI target value	2004	1752	19800	49429	93900	143281	177801	424153
STI target %	2004	1752	15	25	36	44	50	100
STI max %	2004	1411	28	45	60	71	90	150
STI value	2004	1610	0	40000	83914	155843	197003	524688
STI %	2004	1610	0	21	34	45	56	115
LTI value	2004	1714	0	5241	85266	169731	205813	683220
LTI %	2004	1714	0	4	33	49	67	152
Total target variable %	2004	1600	23	41	75	91	120	208
Total variable %	2004	1491	15	38	75	96	125	232
Total Target Cash	2004	1870	136347	220379	333167	433308	556234	1055873
Total Cash	2004	1870	131793	209820	326771	441672	563132	1112910
Total Target Direct Compensation	2004	1714	160004	265939	443153	615929	793100	1634254
Total Direct Compensation	2004	1714	151525	253733	440691	625200	800028	1794556
Age of individual	2004	1465	39	45	50	50	55	60
Tenure position (years)	2004	1113	0	1	2	3	4	8
Tenure company (years)	2004	908	1	5	13	15	23	34
Span of control (# of employees)	2004	733	7	304	1579	5930	5500	26000
Company total employees	2004	306	1031	8741	24264	43890	61732	161310
Company total assets (* 1 mln)	2004	299	503	2362	8043	60523	36835	417148
Company total sales (* 1mln)	2004	297	262	2173	5685	15311	16262	59773
Responsibility (relative size PC)	2004	1490	0	3	8	21	26	95
Base salary	2005	2002	113273	180000	252583	305763	377578	650000
Base increase %	2005	1311	0	2	4	6	7	17
STI target value	2005	1928	20000	51820	98755	153666	183640	475687
STI target %	2005	1928	15	27	40	44	50	94
STI max %	2005	1616	26	45	60	73	100	150
STI value	2005	1586	13025	49875	99885	176395	214500	536961
STI %	2005	1586	8	26	41	51	61	113
LTI value	2005	1904	0	19113	72810	189634	180951	636376
LTI %	2005	1904	0	10	30	48	56	140
Total target variable %	2005	1832	22	44	70	89	108	198
Total variable %	2005	1514	18	45	74	101	120	247
Total Target Cash	2005	2002	140000	235383	352386	453750	556906	1097836
Total Cash	2005	2002	135003	226724	337642	453644	546889	1100000
Total Target Direct Compensation	2005	1904	161130	281115	454517	652539	772053	1730547
Total Direct Compensation	2005	1904	152846	273156	443457	653141	767740	1726391
Age of individual	2005	1663	39	44	49	49	54	59
Tenure position (years)	2005	1269	0	1	2	3	4	8

Profit Centre Head	year	N	p5	p25	p50	mean	p75	p95
Tenure company (years)	2005	1492	1	5	12	15	24	34
Span of control (# of employees)	2005	1139	10	250	1304	5547	5234	25000
Company total employees	2005	344	881	7044	21843	45087	64102	167801
Company total assets (* 1 mln)	2005	340	311	2240	7165	70939	30106	383392
Company total sales (* 1mln)	2005	339	257	1924	5595	16056	16528	61303
Responsibility (relative size PC)	2005	1663	0	2	8	21	27	100
Base salary	2006	1951	109776	175351	257250	317171	400000	721964
Base increase %	2006	1268	0	3	4	6	7	17
STI target value	2006	1878	22460	52520	95711	170649	202149	541473
STI target %	2006	1878	15	28	40	46	50	100
STI max %	2006	1677	25	42	60	75	90	165
STI value	2006	1744	11200	46248	87744	205773	199457	697392
STI %	2006	1744	7	25	37	54	59	125
LTI value	2006	1891	0	10293	62100	186851	170875	696182
LTI %	2006	1891	0	6	25	44	50	129
Total target variable %	2006	1820	20	40	67	87	106	215
Total variable %	2006	1707	18	40	67	99	116	250
Total Target Cash	2006	1951	136256	231840	357500	481436	592500	1210000
Total Cash	2006	1951	138264	234536	350127	508664	574683	1277516
Total Target Direct Compensation	2006	1891	147550	266780	431842	661936	766143	1863864
Total Direct Compensation	2006	1891	146899	267100	433763	693284	766131	1933737
Age of individual	2006	1685	39	45	49	50	55	60
Tenure position (years)	2006	1314	0	1	3	3	5	9
Tenure company (years)	2006	1626	1	5	13	15	24	34
Span of control (# of employees)	2006	980	12	198	975	4289	4000	19951
Company total employees	2006	330	692	6689	19627	45426	61900	164078
Company total assets (* 1 mln)	2006	325	381	2461	8021	78088	32190	512185
Company total sales (* 1mln)	2006	325	288	1867	5802	16202	14509	66152
Responsibility (relative size PC)	2006	1594	0	3	10	22	30	100
Base salary	2007	1810	109600	174100	253536	309974	386004	692670
Base increase %	2007	1034	0	3	5	7	8	20
STI target value	2007	1711	26551	54817	107941	186934	210000	600000
STI target %	2007	1711	17	30	41	52	60	110
STI max %	2007	1437	30	44	67	86	100	200
STI value	2007	1657	20157	52940	107514	253706	246282	825146
STI %	2007	1657	12	28	44	68	75	168
LTI value	2007	1715	0	16117	79603	197952	205166	753032
LTI %	2007	1715	0	9	32	50	64	151
Total target variable %	2007	1619	25	48	79	98	124	233
Total variable %	2007	1581	23	48	82	120	139	298
Total Target Cash	2007	1810	135705	235419	361823	486684	593741	1268500
Total Cash	2007	1810	145062	234739	359890	548965	609000	1479380
Total Target Direct Compensation	2007	1715	163645	277200	448329	690297	821188	2000844
Total Direct Compensation	2007	1715	163495	275893	460000	756647	851282	2255049
Age of individual	2007	1455	40	45	49	50	55	61

Profit Centre Head	year	N	p5	p25	p50	mean	p75	p95
Tenure position (years)	2007	1159	0	1	3	4	5	10
Tenure company (years)	2007	1428	1	5	13	15	23	34
Span of control (# of employees)	2007	893	11	170	902	4796	3800	21117
Company total employees	2007	330	700	7097	20738	47270	62009	175000
Company total assets (* 1 mln)	2007	324	349	2690	9354	94953	34646	497679
Company total sales (* 1mln)	2007	324	217	2171	6016	19768	16282	72448
Responsibility (relative size PC)	2007	1442	0	2	9	19	25	84
Base salary	2008	2075	111800	166800	238586	302218	369802	700000
Base increase %	2008	828	0	3	5	6	8	19
STI target value	2008	1881	27626	53900	95010	181684	191500	606085
STI target %	2008	1881	17	30	40	51	60	102
STI max %	2008	1547	30	42	60	82	100	200
STI value	2008	1904	5500	47485	96981	239439	214177	816143
STI %	2008	1904	3	27	42	63	69	142
LTI value	2008	1921	0	21864	63600	171361	179974	641689
LTI %	2008	1921	0	11	30	43	53	123
Total target variable %	2008	1757	25	50	77	92	112	213
Total variable %	2008	1785	17	47	80	107	123	251
Total Target Cash	2008	2075	141507	221130	324000	466917	538744	1237652
Total Cash	2008	2075	138000	223066	335000	525964	569195	1421914
Total Target Direct Compensation	2008	1921	159572	260260	393490	642157	750000	1834066
Total Direct Compensation	2008	1921	155820	260000	410865	704878	767775	2054672
Age of individual	2008	1130	39	45	50	50	55	61
Tenure position (years)	2008	1233	0	1	3	4	5	10
Tenure company (years)	2008	1645	1	6	14	15	24	35
Span of control (# of employees)	2008	914	18	265	1101	5468	4163	24767
Company total employees	2008	308	750	6253	20839	51236	67554	186049
Company total assets (* 1 mln)	2008	302	367	2947	9612	109227	42893	647027
Company total sales (* 1mln)	2008	298	306	2128	6088	22958	19019	81334
Responsibility (relative size PC)	2008	1392	0	2	8	18	25	76

Appendix 4.4: Heckit table sample selection equations

This table shows the sample selection equation (CEO remains in position) as part of the Heckit model relating to table 4.16 and 4.18.

Variable		Base salary gap (ln)	TTC gap (ln)	TDC gap
TTDC				3.629e-07***
Reporting level difference		.1895486***	.20467706***	.19640988**
Age difference		0.00329115	0.0052646	-0.00008652
Externally hired recently difference		-0.01172243	0.00248488	0.06184714
Position tenure difference		-0.00100655	-0.00536286	0.01931083
Company tenure difference		0.00015227	0.0006949	0.00389838
International scope difference		-0.00515073	-0.03186174	-0.01012449
Previous CEO		0.01071967	-0.0674308	-0.12406185
CEO age	Superset	0.00420802	-0.00693439	0.01209669
CEO exthired. rec.	Superset	0.10974132	-0.05728351	-0.07423294
CEO position tenure	Superset	.37466895***	.37815404***	.31141496***
CEO tenure	Superset	.01126921*	0.0090911	0.00749915
CEO international scope	Superset	0.05603821	0.11813024	0.00529689
Dummy CEO = Chair		.65580926**	.87526075***	1.0454613**
CEO share value owned		0.000000001972	1.820e-09*	0.000000001049
CEO share percentage owned		-.04305281***	-0.05157526	0.05107305
Dummy female CEO		.73806186*	1.0812954*	-0.03253992
Dummy education (PhD, Prof)		0.00938308	0.16598001	0.89651244
Financial paper (control)		-0.00163326	-0.00111626	-0.00167883
Large paper (control)		0.00039459	-0.0011162	-0.00035558
Media CEO		-0.00120336	0.00162867	-0.00268105
Company assets (ln)		-0.00134401	0.00088613	0.03807978
Span of control difference		-2.484e-06**	-2.754e-06**	-2.932e-06*
Sales difference		0.000001021	0.000001249	0.0000007523
Company age (years)		0.00137844	0.00040242	.00242912**
IPO age (categories)		0.01720575	0.01110329	0.02803434
Diversification level (conglomerate)		0.11030201	0.0665853	-0.0675978
Governance (dummy two-tier board)		0.06923833	0.11599046	-0.15403096
Size of the main board		0.0285001	0.01591203	-0.00216434
NED percentage on main board		0.001889	-0.00084282	-0.00045626
Size of the Supervisory Board		0.03213544	0.03454721	0.05196252
Tobin's Q (market-to-book)		0.00166787	0.00183166	0.00227621
Liquidity ratio		0.01217558	-0.03682133	-0.09058953
Solvency ratio		0.00161528	0.00076063	-0.00040349
ROCE		-0.00032372	-0.00153752	0.00300166
Profit margin		0.00085953	-0.00073067	-0.00200712
Gearing		0.00020941	0.0002009	0.00033698
Interest coverage		0.00002972	0.00007238	0.00014507
Capital expenditure % of sales		0.00006038	0.00057122	0.0004579
Volatility		-.00134313**	-0.00125066	0.00489169

Variable	Base salary gap (ln)	TTC gap (ln)	TDC gap
Block holders total %	0.00018392	-0.00012004	-0.00021653
Block holder % (insurance company)	.00965025*	.00772002*	.0119486**
Block holder % (bank)	-.00619412*	-.00642808*	-.00742378*
Block holder % (industrial company)	0.0029778	0.00212002	0.00388002
Block holder % (nominee/trust)	-0.00604804	-0.00605051	-0.00676374
Block holder % (financial company)	0.00126172	0.00049663	-0.00181258
Block holder % (individual / family)	0.00825173	0.01660228	.02912138*
Block holder % (foundation)	-0.0004	0.00936703	0.00136367
Block holder % (emp./ man./directors)	0.02922383	.18084736**	-0.04548846
Block holder % (private equity)	0.00576811	0.00493605	-0.00176106
Block holder % (state)	-.00695158*	-0.00471549	-0.00402243
Dummy presence rem. comm.	0.01013558	0.02182818	-0.11585094
Dummy presence rem. advisor	0.05476644	0.13041596	0.05730451
Dummy Towers	0.1721242	0.04457852	0.29750582
Dummy Mercer	-0.32497456	-0.33274841	0.28585134
Dummy NBS	-0.13797197	0.06222563	0.48872667
Dummy Kepler	-.83100831**	-.84431812*	-0.89451271
Dummy Monks	-1.0693001**	-14247569	-13483351
Country dummy (Austria)	-1.3789485***	-1.9645401***	0.03676933
Country dummy (Belgium)	0.11597644	0.30039588	.65013453*
Country dummy (Spain)	-0.44861111	-.73515393*	-0.3729831
Country dummy (France)	-.58314707**	-.60589588*	-0.28997051
Country dummy (Germany)	-0.20799447	-1.0711085**	0.2522474
Country dummy (Italy)	-0.41846429	0.09606664	0.60905219
Country dummy (Sweden)	-0.34275663	-0.15406001	0.18508213
Country dummy (Switzerland)	-.7211577*	-.69510217*	0.54807564
Country dummy (UK)	-0.30041113	-0.04661263	-0.08209246
Time dummy (2008)	-0.14791396	-0.1949759	-.65115177*
Time dummy (2007)	-0.38841913	-0.28143684	-0.29645792
Time dummy (2006)	-0.23266181	-0.17851996	-0.12494982
Time dummy (2005)	-0.24968578	-0.0670487	-0.06304851
Time dummy (2004)	0.0757182	-0.03441118	0.03207074
Time dummy (2003)	-.47636746*	-.49377454*	-0.34613675
Time dummy (2002)	-.66454777**	-.89203218***	-0.58734416
Time dummy (2001)	-.5655981*	-.71482561**	-0.475208
_cons	-0.17653564	0.36161292	-0.83547481
athro	-1.7157819***	-1.3282952***	-.87460526**
lnsigma	-.62305902***	-.64373331***	13.087866***

Appendix 4.5: Overview of literature on the determinants of CEO remuneration

Variable	Positive / negative effect	Reference
Job/firm tenure	+	Bebchuk et al. (2007) Core et al. (1999) Cyert et al. (1997) Finkelstein & Hambrick (1989) Hill & Phan (1991)
Age	+	Bebchuk et al. (2007) Conyon & Murphy (2000) Lewellen et al. (1985)
Externally hired	+	Bebchuk et al. (2002) Bebchuk et al. (2007) Deckop (1988) Murphy (2002) Murphy & Zabojnik (2003)
Education	+	Leonard (1990) Ortín-Ángel & Salas-Fumás (1998)
Ownership stake	+	Bebchuk et al. (2007) Finkelstein & Hambrick (1989) Tosi & Gómez-Mejia (1989)
Firm size	+	Balkin & Gómez-Mejia (1987) Baker et al. (1988) Baumol (1959) Becker (1964) Boyd (1994) Ciscel (1974) Ciscel & Carroll (1980) Conyon & Murphy (2000) Conyon & Schwalbach (2000) Deckop (1988) Finkelstein & Hambrick (1989) Kraft & Niederprum (1999) Lambert et al. (1991) Murphy (1998) O'reilly et al. (1988) Rosen (1982;1992) Simon (1957)
Firm performance	+	Agarwal (1981) Ciscel (1974) Ciscel & Carroll (1980) Conyon & Schwalbach (2000) Core et al. (1999) Deckop (1988) Finkelstein & Hambrick (1989) Hall & Lieberman (1998) Jensen & Murphy (1990a;1990b) Kraft & Niederprum (1999) Lewellen & Huntsman (1970) McGuire et al. (1962) Murphy (1985) O'Reilly et al. (1988)
Capital structure	+	Bebchuk et al. (2007)
Shareholder rights/anti-takeover mechanisms	+	Bebchuk et al. (2007) Borokovich et al. (1997) Fahlenbrach (2004)

Presence of institutional investors	-	Hartzell & Starks (2002)
Presence of large shareholder	-	Bebchuk et al. (2002) Cyert et al. (1997) Dyl (1988) Kraft & Niederprum (1999) Gómez-Mejia et al. (1987) Tosi & Gómez-Mejia (1989)
CEO = chair	+	Boyd (1994) Bebchuk et al. (2007) Conyon & Murphy (2000) Core et al. (1999) Cyert et al. (1997)
Board size	+	Bebchuk et al. (2007 Core et al. (1999) Yermack (1996)
Busy board	+	Core et al. (1999)
Industry factors: * Financial services * Conglomerates	 + +	 Murphy (1998) O'Reilly et al. (1988)
Country factors (Anglo-American firms: dispersed ownership)	+	Abowd & Bognanno (1999) Conyon & Schwalbach (2000) Murphy (1998) LaPorta et al. (1999) Oxelheim & Randøy (2005)