Executive Board Compensation of Publicly Traded Companies in Switzerland:
The Influence of Compensation Gaps between CEOs
and their Direct Reports on Firm Performance

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The University of St. Gallen, School of Management, Economics, Law, Social Sciences and International Affairs hereby consents to the printing of the present dissertation, without hereby expressing any opinion on the views herein expressed.

St. Gallen, October 21, 2013

The President:

Prof. Dr. Thomas Bieger

To my parents

Outline

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List of Abbreviations

Art.	Article
BCG	The Boston Consulting Group
BoD	Board of Directors
CDM	Compensation Disparity Management
CEO	Chief Executive Officer
CG	Consumer Goods
CHF	Swiss Francs
cf.	confer (compare)
EB	Executive Board
ed.	Edition
Ed.	Editor
Eds.	Editors
e.g.	exempli gratia (for example)
et al.	et alii (and others)
EUR	Euro
EVA	Economic Value Added
excl.	excluding
ff.	and the following pages
FE	Fixed Effects
FINMA	Swiss Financial Market Supervisory Authority
FTE	Full-time Equivalent
HP	Highest Paid Member of the Executive Board

i.e.	id est (that is)
incl.	including
Ln	Natural Logarithm
m	Million
MTB	Market-to-Book Ratio
Obs.	Observations
OLS	Ordinary Least Squares
ROA	Return on Assets
ROE	Return on Equity
SEC	US Securities and Exchange Commission
SIC	Standard Industrial Classification
SIX	Swiss Stock Exchange
SMI	Swiss Market Index
SMIM	Swiss Market Index Mid
TMT	Top Management Team
TSR	Total Shareholder Return
US	United States
USD	US Dollars
VP	Vice President

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Summary - German

In den vergangenen Jahren waren die Vergütungen der Unternehmensspitzen in verschiedenen Ländern starker Kritik ausgesetzt. In der Schweiz äusserte sich der Unmut sogar in Volksinitiativen mit dem Ziel, die Vergütungssummen des Topmanagements auf Verfassungsebene einzuschränken. Um faire Vergütungen festzulegen, spielen relative Dimensionen eine wichtige Rolle, beispielsweise wie Managementvergütungen in Relation stehen zu den Vergütungssummen, die auf dem externen Markt für Managementtalente gezahlt werden, aber auch in welchem Verhältnis sie zu den Gehältern anderer Mitarbeiter des Unternehmens und dem Unternehmenserfolg stehen. Diese Dissertation greift den relativen Blickwinkel auf, indem sie die Vergütung des CEOs mit der durchschnittlichen Vergütung der direktunterstellten Manager des CEOs mittels deren Differenz (Compensation Gap) und deren Quotient (Compensation Multiple) vergleicht.

Trotz des hohen Einflusses des Topmanagementteams auf den Unternehmenserfolg fokussierte sich die bisherige Forschung im Bereich Managementvergütung hauptsächlich auf die Vergütung des CEOs, während die Topmanagementteamvergütung nur relativ wenig Aufmerksamkeit bekam. Zudem basierte die bisherige Forschung zur Managementvergütung grösstenteils auf US-amerikanischen Samples, wodurch sich die Frage der Generalisierbarkeit der Forschungsergebnisse aufdrängt, da der US-amerikanische Vergütungsansatz für die meisten anderen Länder als wenig repräsentativ erscheint. Dies unterstreicht den Bedarf an weiterer Forschung mit internationaler Ausrichtung.

Diese Dissertation weitet den Länderfokus der Forschung zu Topmanagementteam-vergütung aus, indem sie ein Sample von börsennotierten Unternehmen mit Firmensitz in der Schweiz untersucht. Mittels multiplen (moderierten) Regressionen wird die Beziehung zwischen CEO Compensation Gaps und Unternehmenserfolg untersucht und die Anwendbarkeit der Tournament Theory und Equity Theory im Schweizer Kontext überprüft. Diese Ergebnisse werden anschliessend aufgegriffen, um Empfehlungen für die Praxis in Form von Guidelines zur Steuerung der Gehaltsunterschiede auf Topmanagement-Ebene zu formulieren. Die Haupterkenntnisse der Dissertation sind, dass Gehaltsunterschiede zwischen dem CEO und den direktunterstellten Managern in einem positiven Zusammenhang mit dem Unternehmenserfolg stehen, aber diese Differenzen dennoch durch Grenzwerte beschränkt werden sollten.

Summary - English

In recent years, top management compensation has been a highly debated topic in a number of countries. In Switzerland, public discontent has manifested itself lately even in political initiatives with the aim of curbing top management compensation sums by means of amendments to the Swiss Constitution. For setting fair compensation, relative dimensions are of high importance – for example how executive compensation sums compare with the compensation sums paid in the external market for managerial talent, with the compensation of other employees of the company, and with the firm's performance. This dissertation takes up the relative viewpoint by setting CEO compensation in relation to the average compensation of the direct reports of the CEO, by calculating their difference (CEO compensation gap) and their ratio (CEO compensation multiple).

Despite the influence of top management teams on corporate success, previous executive compensation research has focused primarily on CEO compensation, while top management team compensation has received relatively scant attention. Moreover, executive compensation research shows a strong US bias with most research drawing on US samples. This raises the question of generalizability of results as executive compensation practices in the US do not seem to be representative of most other countries. Consequently, more executive compensation research on an international level is needed.

This dissertation extends the international horizon of top management team compensation research by focusing on a sample of Swiss-based publicly traded companies. It analyzes the association of CEO compensation gaps with firm performance by means of multiple (moderated) regressions and tests the applicability of tournament theory and equity theory. The dissertation further builds on these results to develop practical recommendations in the form of guidelines for compensation disparity management at the executive board level. The major insights of this thesis are that compensation disparity within the executive board and firm performance generally show a positive association for the Swiss sample, but that compensation disparity management at the top executive level should still rely on limits to CEO compensation multiple.

1 Introduction

> *"Put your hand on a hot stove for a minute, and it seems like an hour.*
> *Sit with a pretty girl for an hour, and it seems like a minute. That's relativity."*
>
> *(Albert Einstein)*

The above quote by Einstein underscores the influence of relativity on the way people judge their own condition. Here, relativity refers to the circumstances that influence our perceptions of certain situations. Relativity is of high importance with regard to compensation as well. Many employees may be satisfied with their salary until they find out that their colleague earns twice as much. Yet, compensation figures of one's colleagues are not easily known in most cases. However, in many countries, this is not the case for members of the executive board[1]. Owing to increasing compensation transparency at the top management levels, compensation of peers may nowadays be perfectly observable for certain top executives of a company (as it is the case in public companies in the US), or executive board members may at least easily compare their own compensation with that of the CEO or another highest paid person in the same company (which is currently the case in many Swiss publicly traded companies). The comparison of one's own compensation package with that of the CEO may result in feelings of being treated unfairly, but it may also lead to contrasting effects of potentially increased motivation at work with the goal of being promoted to CEO. Therefore, employee behaviors resulting from compensation comparisons might impact a firm's performance in either a negative or a positive way.

Against this background, the dissertation seeks to examine whether – and if so, in what sense – the compensation differences between the CEO and other members of the executive board influence firm performance. This might provide first indications

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[1] For a detailed definition of top management-related terms, compare chapter 1.5.1.

regarding which compensation disparity theory[2] may be valid for the Swiss-specific sample used in this study.

Additionally, the study aims to identify contextual factors, so-called moderators or interaction variables,[3] which impact the relationship between pay[4] disparities within the executive board and firm performance. The results will provide further evidence to draw conclusions on the validity of different compensation disparity theories. Thus, with reference to the introductory quotation in this chapter, the study deals with two kinds of relativity – the relativity of compensation figures (what does the CEO earn relative to the other top management team members?) and indirectly the relativity of perception (how are compensation differences perceived by individuals and society?).

In the following parts of the introductory chapter, the research problem will be depicted (Chapter 1.1), the relevance of the topic will be illustrated (Chapter 1.2), and the specific research objectives and questions will be addressed (Chapter 1.3). This is followed by a brief discussion of the research design (Chapter 1.4) and definitions of key terms of this thesis (Chapter 1.5). Finally, the chapter ends with an illustration of the thesis structure (Chapter 1.6).

1.1 Research Problem

Nowadays, executive compensation has become a hotly debated topic, specifically with regard to the high compensation sums frequently awarded to CEOs. This debate has gained in importance since compensation transparency has increased significantly over the past few years. In Switzerland, new legislation has been in force since 2007 which stipulates that Swiss publicly traded companies need to publish more detailed compensation information with respect to their executive board (cf. Chapter 2.1.1 on compensation transparency). In connection with accessible compensation information, the recent financial crisis added fuel to the ongoing debate. In the aftermath of the

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[2] For a definition of compensation disparity and differentiation from compensation dispersion, refer to Chapter 1.5.2. Compensation disparity theories are discussed in Chapter 2.2.

[3] The terms "moderating variable" and "interaction variable" are synonyms. However, for reasons of simplicity, this dissertation employs the term "moderating variable," respectively "moderating effects," instead of "interaction variable" and "interaction effects."

[4] Within this dissertation, the terms "pay" and "compensation" will be used synonymously.

financial crisis, some financial institutions in danger of insolvency had to be saved by means of tax money, but in seeming disregard of their financial situation, they still paid out significant bonus sums.[5]

This raises the question about how far top executive compensation sums are actually linked to their performance. The link between executive compensation and firm performance has been a longstanding topic in academic research, but even though the pay-for-performance relationship has dominated compensation research for the past few decades, results are still ambiguous. Moreover, business magazines have investigated cases in which high CEO compensation sums did not go along with successful company performance. For example, the CEO rating conducted by Bilanz (Ruschmann, 2010, July 2) examined this important link between compensation and firm performance, highlighting which CEOs were actually the "best buy."

The majority of newspaper articles, however, focus on salary excesses, mainly with respect to the Swiss banking industry. For example, Brady Dougan, the CEO of Credit Suisse, stood in the center of attention for his total compensation sum of more than CHF 90 million received in the crisis year 2009, which comprised CHF 1.25 million base salary, CHF 17.9 million bonus (Credit Suisse, 2009: 188) and a payout in shares from a bonus plan adopted in spring 2005 of CHF 71 million (NZZ, 2010, April 1).[6] Even if the CHF 71-million share payout was not taken into account, Brady Dougan was the second highest paid CEO of all banks in the world (Corkery, 2010, March 25).[7]

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[5] Compare, for example, Feser (2009: 2).

[6] However, to set Brady Dougan's compensation package in context: CEOs of SMI companies earned CHF 8.2 million on average in 2009, which is only marginally lower than the compensation paid in the record year 2007 (Neue Zürcher Zeitung [NZZ], 2010, September 29: 28). As noted in Chapter 2.1.1, CEO compensation in Switzerland is assumed to be among the highest in the world, even though the level is still substantially lower than in the United States.

[7] Only Wells Fargo CEO John Stumpf earned more for his work in 2009 with USD 21.3 million (Corkery, 2010, March 25).

The exorbitant total compensation sum paid out to Brady Dougan was reported to have antagonized private and corporate clients as well as institutional investors, and ran the risk of upsetting clients.[8] The ensuing public criticism led to adjustments in the compensation system of Credit Suisse, for example making bonus payments more dependent on the mid-term success of the institution.[9]

In addition to "voluntary" adjustments in the compensation systems of Swiss firms, regulatory pressure has also increased, for example through the FINMA[10] directive concerning compensation schemes in financial institutions.

Furthermore, public discontent has led to such initiatives as the "Minder initiative," a petition accepted in March 2013 that required, among other things, a vote on the compensation of the management and board of directors at the annual stockholders meeting, or the "1:12 initiative" by the Young Socialists Switzerland (a youth organization related to the Social Democratic Party of Switzerland) which demanded a limit on executive compensation at a maximum of 12 times the lowest wage within a company. The latter was rejected in public vote in November 2013. These initiatives hint at another important question regarding compensation systems: Are executive compensation sums perceived as fair? (Bayer, 2011, January 12)

Thus, besides the fact that individual compensation packages constitute significant costs for a firm[11] and may influence executives' behavior and motivation (company-internal perspective), executive compensation decisions can also influence the attitudes of society, and therefore, of potential clients of a company (company-external perspective). As a result, firm performance may be impacted in various ways.

This leads to the question as to how compensation systems should be designed to be congenial to firm performance, which is also the starting point of the dissertation. Basing the argument on motivational theories, this study will approach the question with a focus on large Swiss market-listed firms.

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[8] Compare, for example, NZZ (2010, April 1).

[9] Compare, for example, Schletti (2011, January 11), NZZ (2011, January 11) and Bart and Lucchetti (2011, January 11), as well as Chapter 5.2.

[10] FINMA stands for "Eidgenössische Finanzmarktaufsicht," which denotes the Swiss Financial Market Supervisory Authority.

[11] Cf. Chapter 1.2.2.

To sum up, the topic of executive compensation addressed in this thesis is located at the interface of three research strands. Firstly, finance is concerned as it deals, for example, with the use of financial means of the company. Secondly, it pertains to the human resources research field due to the focus on pay setting and motivational theories. Thirdly, the topic of executive compensation relates to corporate governance since executive compensation constitutes an instrument to manage the principal-agent relationship. Figure 1 illustrates these research branches.
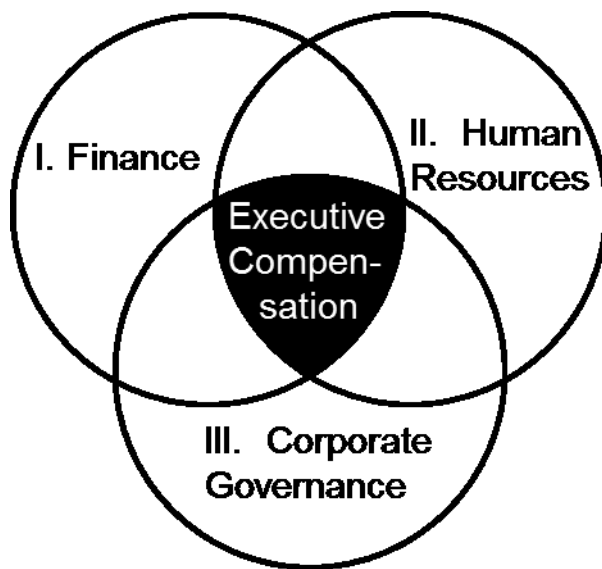
Figure 1: Relevant Branches of Research

1.2 Relevance of the Research

The dissertation seeks to contribute significantly to two areas. To begin with, the *scientific discussion* in the field of top management compensation will be enriched and complemented. Secondly, it will contribute to the *practitioners* in the field of executive compensation by giving insights into how small or large CEO-TMT compensation disparities are expected to affect firm performance and by developing a compensation disparity management (CDM) framework which includes firm cluster-specific implementation paths and general CDM principles. In the following, the theoretical relevance (and research gap) as well as the practical relevance of the topic is described.

1.2.1 Theoretical Relevance and Research Gap

According to a review of compensation articles published in leading management journals between 1996 and 2002, executive compensation was one of the most researched topics in the area of compensation research. It has stimulated debate among researchers, practitioners, and the media for more than 90 years[12] and has attracted the attention of researchers in such diverse fields as management, economics, psychology, sociology, and law (Werner & Ward, 2004: 201–205).

However, previous research on executive compensation has mainly examined the level and structure (i.e. the proportions of salary, bonus, and stock awards) of compensation packages and how these factors are related to firm performance (e.g. Jensen & Murphy, 1990; Yermack, 1995; Hall & Liebman, 1998; Core, Holthausen, & Larcker, 1999; Tosi, Werner, Katz, & Gomez-Mejia, 2000). In addition, most executive compensation studies focused solely on CEO compensation. Even though the overall contribution of TMT members, aside from CEOs, to firms' success may at least be as important as the contribution of the CEOs, non-CEO executive compensation and top management team (incl. CEO) compensation has only been added later to the research portfolio of executive compensation and has received much less attention (Devers, Canella, Reilly, & Yoder, 2007: 1022; Lee, Lev, &Yeo, 2008: 316; Werner & Ward, 2004: 219). As a result, research in the field of TMT (incl. CEO) compensation is still scarce (Devers et al., 2007: 1022; Lee et al., 2008: 316; Werner & Ward, 2004: 219). Although within the realms of TMT (incl. CEO) compensation research, most studies explore compensation differences within the executive board, the number of studies is still very limited, and hence, can be identified as the first research gap.

This gap is even more relevant since past research is at odds with regard to the adequate compensation distribution at the executive board level: Some studies support the tournament theory that favors large compensation gaps in order to provide performance incentives, whereas other studies provide evidence that a more egalitarian compensation distribution is advantageous for firm performance.

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[12] Taussig and Baker (1925) wrote one of the first empirical studies on the relationship between executive pay and firm performance. US newspapers such as The Wall Street Journal or New York Times started writing about executive compensation sums of banking and railroad executives in the early 1920s (Frydman, 2009).

Moreover, Hengartner (2006) postulates that more research on the link between executive compensation dispersion and firm performance would be an asset as past findings are sometimes inconsistent in this regard.

However, for the limited universe of studies on compensation differentials within the executive board, another secondary research gap can be identified in terms of the geographical focus of research activities and objects. As illustrated by the literature review (cf. Chapter 2.4), most research was conducted by authors in the United States and focused on samples consisting of US-based firms.[13] As a consequence of this regional focus of research and the US-specific context, the results might reflect a US bias and it is questionable to what extent the results are valid for other national contexts or even on a global scale, because, as Berrone and Otten (2008: 121) observe, *"well known variances between countries of pay levels and makeup indicate that the US case seems to be more of an outlier than the worldwide standard."*[14] This is also underlined by the fact that in US firms, *"non-CEO executives earn approximately 40 percent of the CEO's compensation"* (Conyon, 2006: 28), reflecting large compensation gaps which keep rising (Useem, 2003). Furthermore, different countries have different corporate governance structures, which might alter the effect of compensation distributions on individual and firm performance (Conyon, Peck, & Sadler, 2001: 813). Therefore, in order to be able to generalize past findings, more studies on compensation distribution within the executive board in different countries are necessary.

To sum up, the research gap to be addressed within this work is both a topical and a geographical one. The topical research gap stems from the fact that TMT (incl. CEO) compensation – and in this connection, the issue of CEO-TMT compensation differentials and their association with firm performance, which will be studied in this dissertation – is an under-researched topic. The geographical research gap is due to the geographical coverage of extant research samples with a primary focus on the US. Within this dissertation, research efforts will be extended to a sample consisting of Swiss-based publicly traded companies. In line with this, the international

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[13] The focus on US samples is not just a characteristic of research on executive pay disparity, but is preeminent in the entire field of compensation research (Werner & Ward, 2004: 223).

[14] Compare also Werner and Ward (2004: 223).

applicability of past research results regarding CEO-TMT compensation disparity will be tested with respect to Switzerland.

1.2.2 Practical Relevance

There are numerous reasons why the dispersion within compensation systems may be of high importance to practitioners. In the following section, four important arguments will be presented.

Firstly, Hilb (2007: 9) points out that the trend toward globalization of the Swiss economy brings about disproportionate increases in CEO compensation according to the US compensation approach, thereby leading to higher compensation disparity within the same firm. This trend is especially noticeable in large international companies. In order to deal with this trend in the right way, understanding the performance effects of compensation disparity is essential.

Secondly, it has been shown in a large number of research works in the field of organizational justice that the distribution of compensation tends to influence the attitudes and behavior of employees, for example job satisfaction and performance on the job, as well as organizational commitment and withdrawal (Folger & Cropanzano, 1998; Greenberg, 1990).[15] The importance of compensation distribution may be traced to the fact that people frequently value the absolute sum of their rewards less than the relation of their own rewards compared to those of relevant others, since reward distributions reflect an individual's relative performance, as well as their value and standing within the organization (Folger & Cropanzano, 1998; Frank, 1985). For example, the distribution of compensation may affect how much effort employees put into their work and whether they leave or remain with an organization (Lazear & Rosen, 1981; Mahoney, 1979), which also may have an important impact on an

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[15] However, as Pfeffer (1994) rightly notes: "People are motivated by more than money – things like recognition, security, and fair treatment matter a great deal" (37).

organization's performance.[16] As compensation policy-makers' ultimate goal should be to shape compensation systems in a way to further organizational performance, taking decisions about compensation distribution is one of their most important tasks (Bloom & Michel, 2002: 33).

Thirdly, the aggregated compensation sums of the executive board account for a significant cost fraction in many organizations. As Bebchuk and Grinstein (2005: 297) show, the significance of TMT (incl. CEO) compensation paid by US companies increased considerably: While the ratio of aggregate executive compensation[17] to aggregate firm earnings amounted to 5% during the period 1993–1995, this ratio increased to 9.8% during 2001–2003. Hence, spending such compensation sums in a judicious manner should be of high importance.

Finally, external stakeholders, such as shareholders or regulatory authorities, have recently put more pressure on organizations to justify their executive compensation payouts (Dulebohn & Werling, 2007). This is underlined by the fact that the compensation report is often subjected to strong criticism at the annual general meeting. Therefore, compensation policy-makers need to understand the impact of their compensation decisions in detail so that they are able to competently explain the rationale for the compensation decisions.

To sum up, the general importance of compensation decisions is very well described by Dulebohn and Werling (2007: 191): *"From a general management perspective in addition to the significant cost of doing business associated with compensating employees, the implications of compensation decisions are among the most important in remaining viable, achieving competitiveness and remaining competitive."*

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[16] As Dulebohn and Werling (2007) highlight, research has shown that compensation distribution may also influence employees' behavior in such a way that they act toward restoring equity in case they feel over- or underpaid (cf. Gerhart, Minkoff, & Olsen, 1995), while reactions to underpayment have found stronger support in research (cf. Adams & Freeman, 1976; Mowday, 1991; Sweeney, 1990). In case of overpayment, employees tried to improve their work performance while in case of underpayment, they reduced work input or showed counterproductive behavior (cf. Pfeffer & Langton, 1993; Pfeffer & Davis-Blake, 1992).

[17] In line with the data available on the ExecuComp database, the aggregate sum of executive compensation is defined as the sum of compensation paid out to the top five individuals within the respective company (Bebchuk & Grinstein, 2005: 297).

1.3 Research Objectives and Research Questions

The objective of this dissertation is to shed light on the elaborated research gaps concerning CEO-TMT compensation distributions. More precisely, it aims to contribute to a better understanding of the relationship between compensation differentials within the executive board and firm performance. This involves a review of existing theories that explain this relationship as well as past research results on the topic. Based on these insights, the mentioned relationship will be empirically examined for a sample of the largest market-listed Swiss-based companies.

The empirical analyses also cover the influence of potential moderating variables which may strengthen or weaken the relationship between CEO compensation gap and firm performance. As a result, recommendations for practice, including a CEO-TMT compensation disparity management framework, as well as for research will be derived.

On the basis of these objectives, the following five research questions will be addressed in this study:

1. How can compensation differences within the executive board be measured?

2. Is there a link between CEO compensation gap and firm performance? How are the underlying compensation measures (CEO compensation and TMT compensation) linked with firm performance?

3. Which moderating variables[18] influence the strength of the relationship between CEO compensation gap and firm performance?

4. Which CEO-TMT compensation distribution theory is supported by the results?

5. Which recommendations for practice and research can be derived with regard to compensation disparity at the executive board level?

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[18] In the following, moderating variables are also referred to as "moderators."

1.4 Research Design

Quantitative analyses form the main part of the empirical section of this study (cf. Chapter 3). But why was a quantitative approach selected? According to Eisenhardt (1989: 538), quantitative methods are applied when hypotheses are to be tested based on already existing theory. This is the case for the topic at hand, since there are various, though competing, theories that explain the relationship between CEO-TMT compensation distribution and firm performance.

The quantitative analyses employ a cross-industry research approach which is in line with the majority of other studies conducted on CEO-TMT compensation differentials. The research is based on a four-year panel dataset, even though the analysis will not focus primarily on the development over time. Instead, this approach was chosen mainly to increase the number of observations and, following Hengartner (2006: 103), data quality aspects. According to Verbeek (2004), accuracy of estimators is increased by the use of panel data: More efficient estimators are produced based on panel data compared to the estimators resulting from a series of cross-sectional analyses. Furthermore, the increased number of observations through the compilation of panel data allows testing moderating effects. This would not have been possible for the lower numbers of annual observations when regressing only on yearly data, as a minimum number of 120 observations is recommended for moderated regressions[19] (Stone-Romero & Anderson, 1994).

The major quality criteria for quantitative empirical research are reliability and validity. Reliability refers to the stability of measurements over time and boils down to the question: *"If the same instruments were given to the same people, under the same circumstances, but at a different time, to what extent would they get the same scores?"* (Punch, 2005: 95) Validity denotes the extent to which measurement instruments and methods actually measure what they are meant to measure. The concepts of reliability and validity are illustrated in Figure 2.

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[19] Also compare Chapters 3.1.1 and 3.4.3.
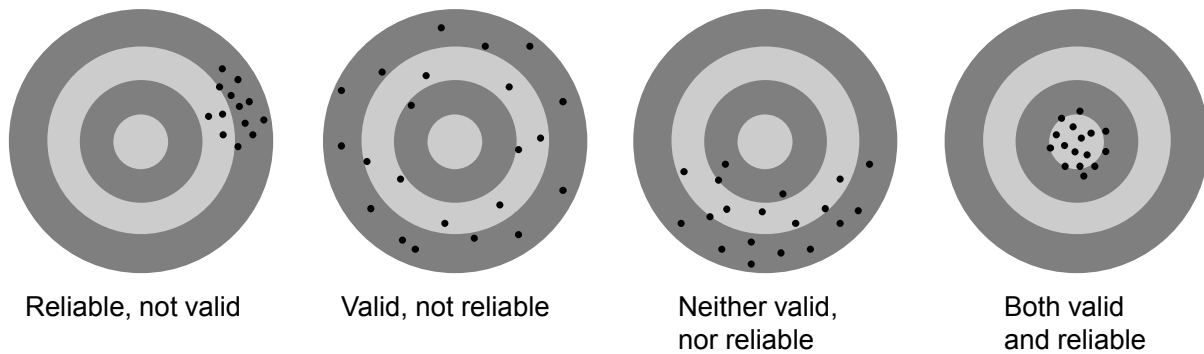
Figure 2: The Concepts of Reliability and Validity[20]

To deal with these quality criteria, the variables used in the quantitative analyses of the empirical section are operationalized based on clear quantitative measures and rely on publicly available secondary[21] data. The compensation data is retrieved from the Ethos reports on executive compensation in Swiss publicly traded companies for the years 2007, 2008, 2009, and 2010.[22] The companies contained in the Ethos report are either part of the Swiss SMI or SMIM indices[23]. For firm performance measures, the Thomson One Banker as well as Thomson One database was used, but some data, mainly information on CEO and TMT characteristics for the moderating variables, had to be collected manually from the annual reports of the sample companies, firms' webpages and press research. For further information on the data used as well as the selection criteria and the sampling method, refer to the empirical part (cf. Chapter 3.1).

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[20] Source: On the basis of Trochim (2006).

[21] Secondary data denotes data which has already been collected. This is contrasted with primary data, which the researcher collects on their own.

[22] Ethos is a Swiss foundation which strives "to promote the consideration of sustainable development principles and corporate governance best practice in investment activities" (Ethos, no date). In this regard, Ethos regularly elaborates different studies, among them, a yearly publication on executive compensation practices and compensation sums of SMI and SMIM firms.

[23] The SMI stock index is made up of 20 blue chip companies which represent about 85% of the total capitalization of the Swiss stock market, while the SMIM stock index contains the next 30 largest mid-cap companies of the Swiss equity market (SIX Swiss Exchange, 2013).

1.5 Definitions of Key Terms

The definitions for this dissertation relate firstly to the differentiation of TMT and executive board and secondly, to TMT compensation distribution measures.

1.5.1 Top Management Team (TMT) and Executive Board

Within this study, the term *top management team (TMT)* generally refers to the members of the management board, excluding the CEO. Members of the board of directors (BoD) are not included in this definition, unless they are, at the same time, on the executive board. So, which managers belong to the TMT of a firm?

The definition employed in this study is relatively pragmatic: If a non-CEO executive is listed in the firm's annual report as belonging to the TMT and, therefore, their compensation sum is included in the TMT aggregate compensation figure, this person is considered a TMT member.[24] In general, these are the managers who directly report to the CEO. Thus, TMT does not include the CEO. In contrast, the term *executive board* (respective *management board*) will be used when referring to the TMT as well as the CEO.

1.5.2 CEO-TMT Pay Distribution Measures

In the available literature, there are two general terms to describe the differences in compensation within the executive board: Pay disparity and pay dispersion. Even though their meaning is similar, they are not the same. For this dissertation, the terms are defined as follows[25]:

CEO-TMT compensation disparity refers to the inequality of compensation within the executive board. It is generally used in journal articles that apply CEO compensation gap (see definition below) as a measure of compensation distribution within the executive board. Therefore, a large compensation disparity indicates a large difference between CEO compensation and the compensation level of the TMT members.

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[24] This definition assumes that the CEO is the highest-paid member of the executive board whose compensation sum is indicated separately. Therefore, CEO compensation is not part of the TMT aggregate compensation figure, but only the compensation sums of the non-CEO TMT members.

[25] The differentiation between pay disparity and pay dispersion can be well observed in the literature review in Chapter 2.4.

Executive board compensation dispersion refers to the variance or variation of pay within the executive board. This term is frequently used in studies that apply the coefficient of variation (see definition below) as a measure of pay distribution within the executive board.[26] Thus, large compensation dispersion means compensation sums within the executive board vary strongly.

In the following, common measures used in the relevant literature to quantify compensation differences between the highest earning and the other members of the executive board will be described. As will be illustrated in the literature review, there are three approaches to quantify pay differentials within the executive board. In the majority of studies, these approaches are: a) CEO compensation gap, b) CEO's pay slice (CPS), and c) coefficient of variation. Additionally, a fourth measure, d) CEO compensation multiple, will be defined.

a) CEO Compensation Gap

In studies on CEO-TMT compensation differentials, CEO compensation gap is commonly defined as the compensation gap between the CEO or the highest earning executive and the average compensation of a certain number or all of the other TMT members (e.g. Carpenter & Sanders, 2004; Gnyawali, Offstein, & Lau, 2008; Henderson & Fredrickson, 2001; Lin & Lu, 2009; Main, O'Reilly, & Wade, 1993; O'Reilly; Main, & Crystal, 1988; Sharma & Huang, 2010; Kale, Reis, & Venkateswaran, 2009). This definition will also be used to quantify CEO-TMT compensation differences in the empirical part of the study.[27]

The following practical example illustrates the general calculation procedure.

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[26] While most researchers use the terms according to these definitions, a certain degree of fuzziness can be observed in the literature. For example, Bloom (199: 25) defines pay dispersion as the magnitude of inequality in pay inherent in an organization's pay structure, respectively the "spread between pay levels" (26), which corresponds to pay disparity according to the definition used in this dissertation.

[27] Compare Chapter 3.1.2 for a more detailed explanation.

Example:

Total compensation of CEO	CHF 1,000,000
- Average total compensation of TMT members	CHF 400,000
Total CEO compensation gap	*CHF 600,000*

To use the compensation gap variable in regressions, a log transformation is applied by taking the natural logarithm of the calculated compensation gap (for this example: ln [600,000]).

b) *Coefficient of Variation*

Compensation dispersion may also be measured by the coefficient of variation of compensation across the executive board, which is calculated as the standard deviation of compensation of the executive board divided by their mean compensation (Lee et al., 2008; Main et al., 1993; Conyon, Peck, & Sadler, 2001; Siegel & Hambrick, 2005: 265). Since knowledge of the individual compensation sums within the TMT forms the basis for this calculation and since such detailed indications are not available for Swiss publicly traded companies, the coefficient of variation will not be used as a compensation distribution measure for the empirical part of this dissertation.

c) *CEO's Pay Slice*

CEO's pay slice is a measure of CEO-TMT compensation differentials which has been applied in the literature fairly recently by Bebchuk, Cremers, and Peyer (2007). They define the measure as the "the percentage of aggregate top-five total compensation captured by the CEO" (1). This is a useful measure for analysis based on US data, because for US companies, the compensation of the five highest earning management members is usually available and thus, the number of managers whose compensation is part of the aggregate compensation sum is always the same. For Swiss data, the use of this measure is more complicated. In Switzerland, the number of managers whose compensation figures in the total TMT compensation sum fluctuates from firm to firm. Thus, there is no homogeneous basis for comparison between companies. To apply this measure to Swiss data, total compensation of the

TMT would have to be standardized so that the total TMT compensation would always reflect the compensation of the same number of executives. Consequently, the CEO's pay slice measure as defined by Bebchuk et al. (2007) is not applicable to the Swiss dataset used in this dissertation.

d) CEO Compensation Multiple

Like CPS, CEO compensation multiple is a relative measure. It is defined as CEO compensation divided by average TMT compensation and indicates how many times the CEO earns more than the average TMT member. The measure was defined in this dissertation to accommodate the Swiss data availability, as it incorporates average compensation values for the TMT members. In addition, it has the advantage of abstracting from absolute compensation levels, which significantly impact the size of CEO compensation gaps, thereby making compensation differences within the executive board more comparable between firms. This measure will not be used in the quantitative regressions in Chapter 3, but will serve to get a better grasp of compensation differences in Chapters 2.3.2 and 4.

> **Conclusion:** For the regression analyses of this dissertation, *CEO compensation gap* will be used as a measure of CEO-TMT compensation differences. *CEO compensation multiple* will be the main measure within the CDM framework. Both measures relate to *CEO-TMT compensation disparity.*

1.6 Thesis Structure

The dissertation is made up of five main chapters that are primarily geared to the research process. Chapter 1 contains the introduction and Chapter 2 the theoretical part, while the empirical part of the study is covered in Chapter 3. Based on the empirical results, a CDM framework for implementation in practice is derived in Chapter 4. Finally, Chapter 5 presents the conclusions. Figure 3 illustrates the structure.

The *first chapter* gives an overview of the research problem (Chapter 1.1), and illustrates its theoretical and practical relevance (Chapter 1.2). Furthermore, it outlines the research objectives and presents the research questions (Chapter 1.3), followed by

the research design (Chapter 1.4). The chapter ends with the definitions of key terms of the dissertation (Chapter 1.5) and this overview of the thesis structure (Chapter 1.6).

The *second chapter* presents the theoretical basis and the hypotheses. It discusses characteristics of Switzerland as the country selected for the empirical analysis, i.e., its executive compensation practices, its corporate governance structure, and cultural traits (Chapter 2.1). The relevant theoretical models regarding the relationship between CEO-TMT compensation distribution and firm performance are explained in detail (Chapter 2.2) which leads to an introduction to exemplary compensation setting in practice, illustrated by means of best practice company examples (Chapter 2.3). The succeeding comprehensive literature review (Chapter 2.4) builds the basis for the formulation of the hypotheses to be tested in the empirical part of the paper and the conceptual framework (Chapter 2.5).

Starting out with the research methodology (Chapter 3.1), the *third chapter* contains the empirical section of the thesis and provides information about the sample, the operationalization of variables, and the data analysis methodology. It presents the descriptive statistics to highlight the characteristics of the dataset (Chapter 3.2) which are followed by the results of the inferential statistics[28] based on regression analyses (Chapter 3.3) and the robustness tests (Chapter 3.4). The chapter ends with a discussion of the results (Chapter 3.5) and the limitations of the empirical study (Chapter 3.6).

The *fourth chapter* derives a compensation disparity management (CDM) framework to guide compensation disparity decisions in the pay-setting process at the executive board level. Its objectives and development are explained in the introduction chapter (Chapter 4.1), followed by an overview and detailed description of each element of the framework including the derivation of company cluster-specific CDM recommendations and general CDM principles (Chapter 4.2).

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[28] Trochim (2006) describes the purpose of inferential statistics as drawing conclusions on a general condition based on the data, while descriptive statistics just point out characteristics of the data or describe the data and the sample.

The *fifth chapter* concludes the dissertation by summing up the main results (Chapter 5.1) and highlighting the contributions of this research project, both for practitioners (Chapter 5.2) and for theory (Chapter 5.3). Finally, it discusses general limitations of the dissertation and outlines further research directions (Chapter 5.4).
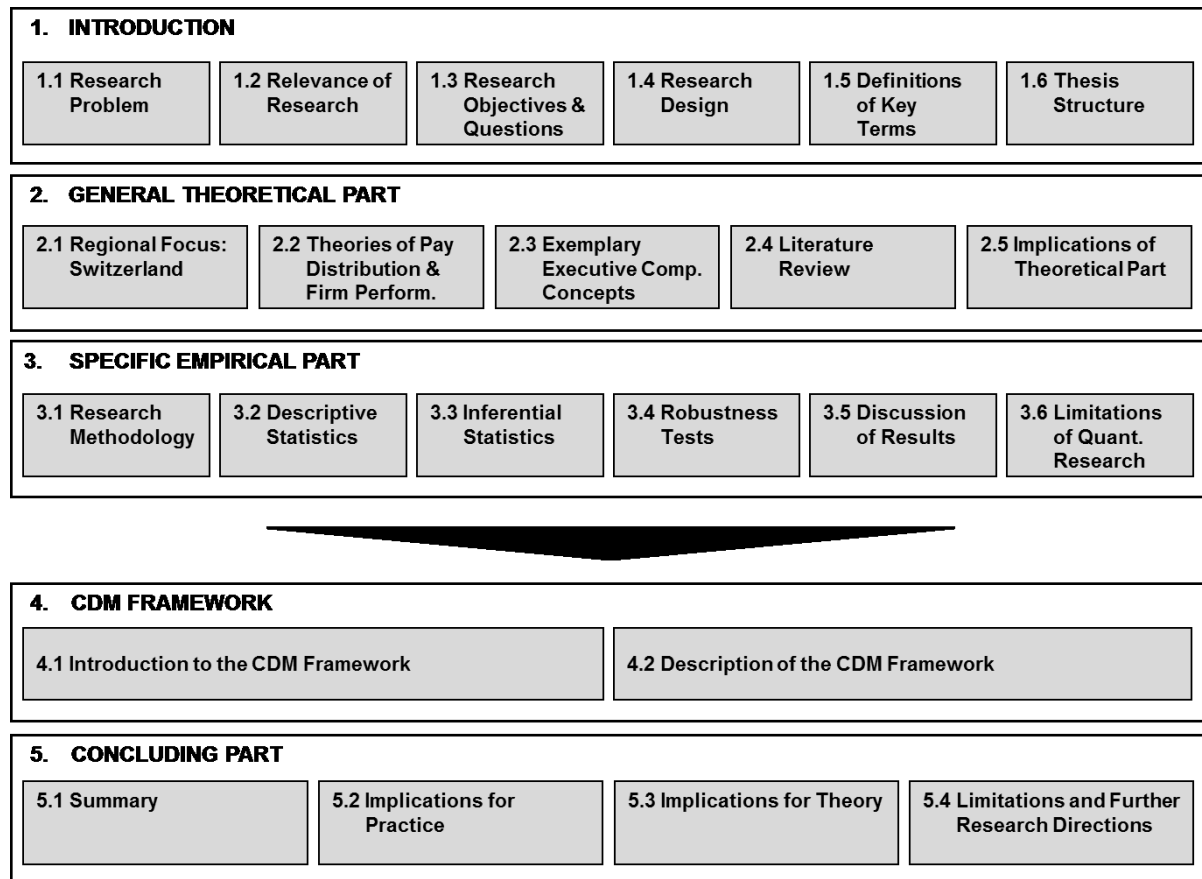
Figure 3: Structure of Thesis

2 General Theoretical Part

The second chapter provides detailed information about Switzerland which is the focus country of this dissertation (Chapter 2.1). Furthermore, theories explaining how CEO-TMT pay distribution affects firm performance are discussed (Chapter 2.2), followed by a discussion of exemplary executive compensation concepts (Chapter 2.3). The literature review (Chapter 2.4) gives an overview of the current state of knowledge, on the basis of which hypotheses in this study are formulated, followed by a conceptual framework describing the content of the quantitative research of this thesis (Chapter 2.5).

2.1 Regional Focus: Switzerland

As mentioned in Chapter 1.2.1, the study closes a research gap by focusing on Switzerland. Since compensation practices differ across countries, the following chapter describes the specific situation in Switzerland with respect to executive compensation. Besides, the specifics of Swiss corporate governance structures and culture are elaborated since these are considered to have an important influence on compensation practices and outcomes.

2.1.1 Compensation

This subchapter provides information regarding the level of executive compensation in Switzerland and places it in context by comparing it with the compensation levels in other countries. Furthermore, compensation structure, compensation transparency, and regulation issues (the Minder Initiative) are discussed.

Compensation Level

Despite the ongoing criticism of excessive CEO compensation (see also Chapter 1.1), the absolute level of management compensation in Switzerland, just as in Europe in general, is rather moderate when compared to US levels.[29] As pointed out by the Economic Policy Institute (2005), while the average pay (excluding bonuses and non-cash compensation) of CEOs in the US with USD 2.2 million in 2003 was about three times as high as that of CEOs in other countries, Switzerland comes second with just under USD 1.2 million average pay for CEOs. Thus, on an international level, management pay in Switzerland was closest to that of the US, even though it still only reached slightly more than 50% of the US pay level (Economic Policy Institute, 2005).

However, pay levels of US CEOs decreased significantly during the recent financial crisis. In 2007, aggregate CEO compensation of the 500 largest US firms[30] was reduced by 15% and amounted to USD 12.8 million on average. For 2008, there was a cut of another 11% and an average CEO compensation of USD 11.4 million, while for 2009, the aggregate CEO compensation was cut by 30%, leading to an average CEO compensation of USD 8 million (DeCarlo, 2008, April 30; 2010, April, 28; DeCarlo & Zajac, 2009, April 22). However, in 2010, US CEOs could then again profit from an increase in compensation sums by 12%, leading to an average total CEO compensation of USD 9 million (DeCarlo, 2011; April, 13). For 2011, total CEO compensation in the US rose by 16% to USD 10.5 million (DeCarlo, 2012, April 4).[31] Consequently, by 2011, half of the CEO paycuts of the financial crisis were already offset.

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[29] Also Vicente Cuñat from the London Business School (cited in Stinson, 2008, June 30) states that CEO compensation in Europe is generally lower than in the USA. He mentions that French CEOs earned 56% of American CEOs in 2005, while German and British CEOs earned 55% and Italian CEOs 53% of the average salary of American CEOs.

[30] Firm size is measured by a "composite ranking of sales, profits, assets and market value" (DeCarlo, 2010, April 28).

[31] The following approximate CHF figures result when converting the USD compensation values with the average annual exchange rates (ER; indicated in parentheses) for 2007 to 2011 (from Oanda.com): CHF 15.4 million for 2007 (ER=1.20); CHF 12.3 million for 2008 (ER=1.08), CHF 8.7 million for 2009 (ER=1.09); CHF 9.4 million for 2010 (ER=1.04) and CHF 9.3 million for 2011 (ER=0.89).

For comparison, PricewaterhouseCoopers (PwC) (2009, 2010, 2011) indicates the following compensation sums for CEOs of SMI firms (i.e. 20 largest publicly traded Swiss-based firms): In 2007, the median total CEO compensation was CHF 7.7 million, with an average total CEO compensation of CHF 9.3 million. The median for CEO total compensation in 2008 dropped to CHF 5.4 million, with an average of CHF 6.9 million. In 2009, the median total compensation increased to CHF 5.9 million and the average to CHF 8.2 million. For 2010, median total CEO compensation in Switzerland increased to CHF 7.5 million, whereas the average decreased again to CHF 7.2 million. Thus, compensation levels in Switzerland decreased from 2007 to 2008, too, and following moderate increase, median total compensation sums were almost back at the 2007 levels again by 2010.

For SMIM firms, the median total CEO compensation in 2007 summed up to CHF 2.8 million and the average to CHF 3.8 million. In 2008, these numbers decreased to a median of CHF 2.5 million and an average of CHF 2.9 million. A further decrease is visible in 2009 figures for the median to CHF 2.2 million, while the average remained at CHF 2.9 million. The median in 2010 was on the same level as 2008 with CHF 2.5 million, the average amounted to CHF 2.8 million (cf. PwC, 2009, 2010, 2011). Figure 4 illustrates these CEO compensation figures.
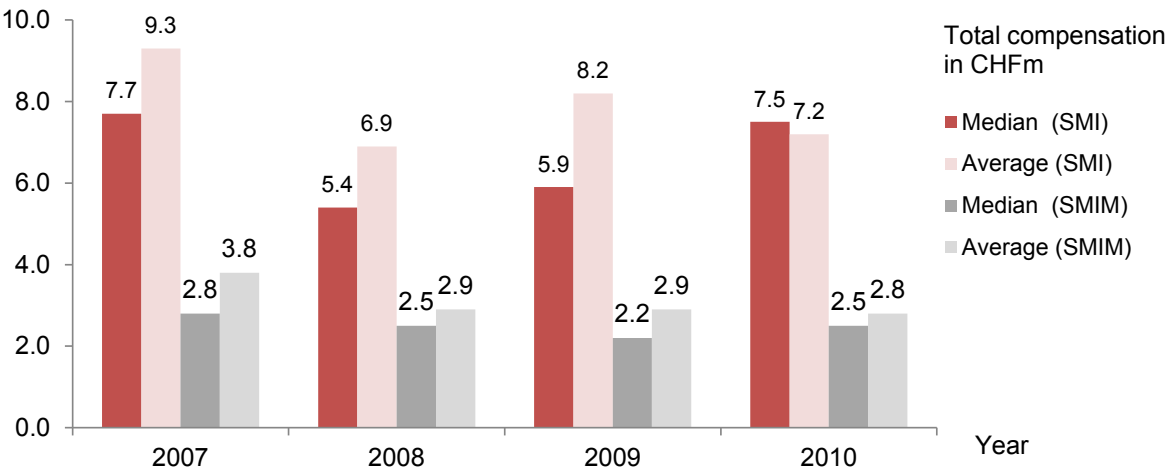
Figure 4: CEO Compensation in Switzerland[32]

Already at first sight, there seems to be a clear difference between the average compensation of CEOs in the largest US firms and the compensation of those in the largest Swiss firms as represented in the SMI (except for 2009 when both average CEO compensation figures were located between CHF 8 and 9 million). Figure 5 contrasts the CEO compensation figures for Swiss SMI firms and the 500 largest US firms on the basis of CHF values.
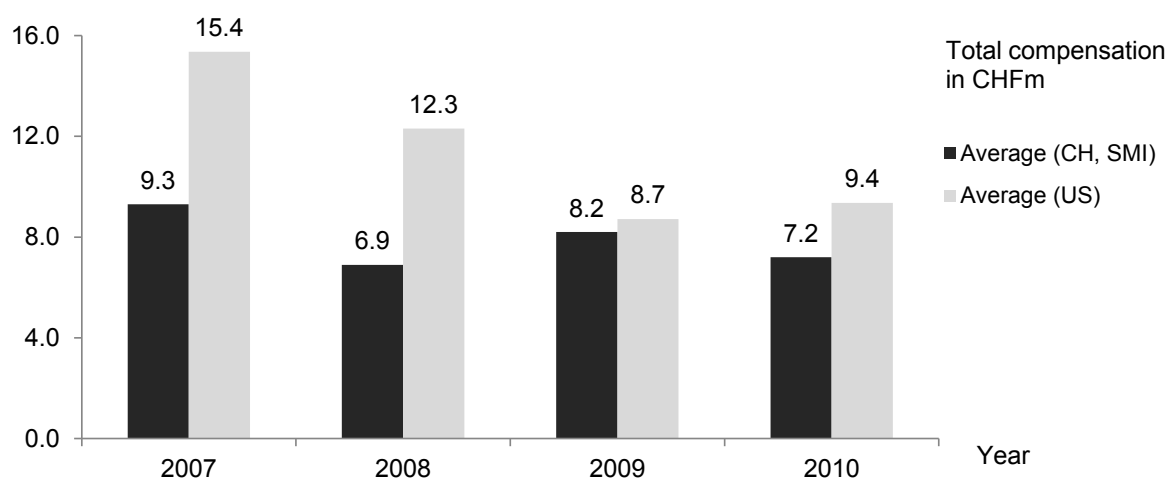
Figure 5: CEO Compensation in Switzerland and the US[33]

However, it has to be kept in mind that the US average is calculated as an average of 500 firms, while the SMI comprised only 20 firms in 2009, which further underscores the prevalence of high CEO compensation levels in the US. Additionally, it is not exceptional that total CEO compensation sums in some US firms go beyond USD 100 million a year.[34] This observation, too, renders the compensation differences even more significant.

However, Conyon, Fernandes, Ferreira, Matos, and Murphy (2011) document in a recent study, after controlling for firm ownership and board characteristics, that US CEOs are only paid slightly more than their European counterparts. Furthermore, they provide evidence for a stronger pay and firm performance link in US firms than in

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[33] Source: based on DeCarlo (2008, April 30; 2010, April, 28; 2011, April 13; DeCarlo & Zajac, 2009, April 22) and PWC (2009, 2010 and 2011).

[34] According to DeCarlo (2010, April 28), the highest-earning CEOs in the largest US firms in 2009 were H. Lawrence Culp Jr (Danaher) with USD 141 million in 2009, Lawrence J. Ellison (Oracle) with USD 130 million and Aubrey K. McClendon (Chesapeake Energy) with USD 114 million.

European firms which may be attributable to the fact that US executives receive more compensation in form of stock and options.[35] Especially striking is their comparison of compensation levels of Swiss and US firms in 2008, which only includes firms with more than EUR 100 million in revenues: The average total CEO pay[36] of EUR 3.6 million for Swiss companies was then almost adequate to that of US firms with an average total CEO pay of EUR 3.8 million. Yet, this observation is relativized when considering the median total CEO compensation, which makes up slightly more than EUR 1.3 million in Swiss firms, compared to over EUR 2.4 million in US firms. Moreover, the number of firms used in this calculation is important as the US averages are based on 1,426 firms in contrast to 29 Swiss firms (Conyon et al., 2011: 45).

However, the study by Conyon et al. (2011) also clearly shows the extraordinary position of Switzerland in terms of executive compensation levels in Europe. The average total CEO compensation in Swiss firms is by far the largest in the European countries considered in the study[37], while the median is located in the center span. Besides hinting at the generally high wage level in Switzerland, these high total CEO compensation sums may partly also be explained by some outlier firms which lift the average with their extraordinarily high CEO total compensation sums.

To draw another comparison on an international level, Japan is selected as reference country due to its differing national culture that calls for a different compensation approach (Hilb, 2009: 244). Executive compensation in Switzerland is regarded as being significantly higher than that in Japan. In their study based on 2004 data, Nakazato, Ramseyer, and Rasmusen (2006) confirm that Japanese executives earn approximately one-fifth of the compensation of US executives. As compensation levels in Switzerland have been described as slightly above 50% of the American

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[35] Interestingly, the study also finds a strong link between bonuses and shareholder returns for European banks, while this link is not shown to be significant for other industry sectors. In line with this, Conyon et al. (2011) also note that both in the US and in Europe, banking executives had to bear large losses as a result of the recent financial crisis, which was less the case for non-banking executives. Therefore, based on this evidence, the authors argue that bonus programs in banks were not the cause of excessive risk-taking.

[36] Conyon et al. (2011) define total pay as the aggregate value of salaries, bonuses, benefits, stock options and other shares which executives received during the fiscal year 2008.

[37] Besides Switzerland and the United States, the following countries are included in the study: Belgium, France, Germany, Ireland, Italy, the Netherlands, Sweden, and the UK.

levels (Economic Policy Institute, 2005), the Swiss levels can be localized approximately in the middle of US and Japanese levels.

Having discussed the height of compensation sums in Switzerland, the next question to be tackled is: "How are compensation sums set in Swiss companies?" The determination of executive compensation of Swiss companies is usually based on regional benchmarks. While 90% of the Swiss companies surveyed by KPMG in 2006 used processes based on Swiss benchmarks for the determination of management compensation, the percentage for the use of European benchmarks is just 40% and for US benchmarks only 7% of the surveyed companies.[38] Figure 6 illustrates these percentages as well as the respective percentages for the determination of board of director compensation.

As can be seen in Figure 6, compensation determination for the executive board relies more heavily on international benchmarks than board of directors' compensation setting, even though 90% of companies still use Swiss benchmarks for compensation setting at the executive board level. Additionally, only a small percentage of firms use US benchmarks that are assumed to increase Swiss executive compensation sums. This indicates that executive compensation levels in few Swiss companies are directly influenced by the high US compensation levels. It also reflects a preference for country-adjusted pay approaches, whereas the international market for managerial talent does not seem to have a large impact on Swiss compensation levels (KPMG, 2006: 3).

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[38] The study included the 500 Swiss companies with the highest sales figures, excluding financial services companies (KPMG, 2006: 10).
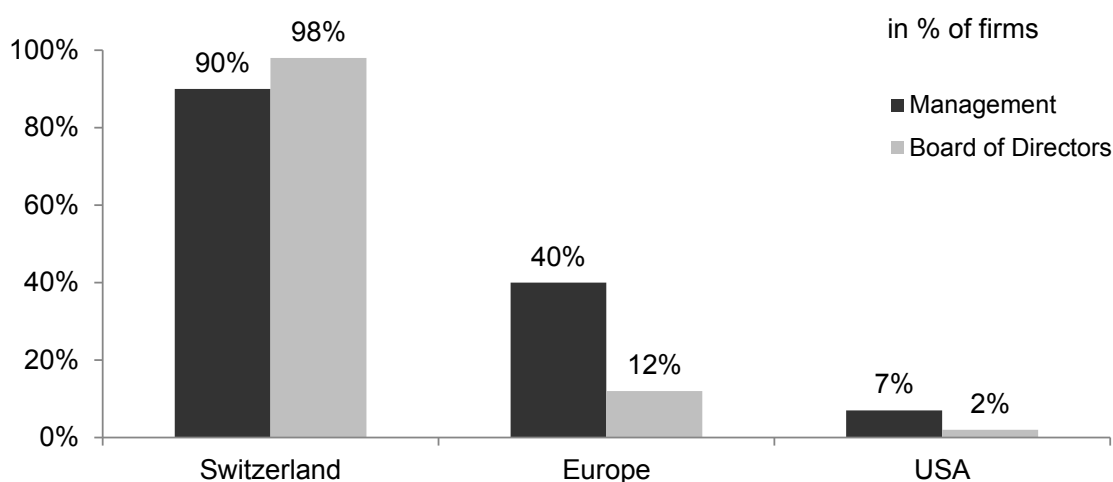
Figure 6: Regional Benchmarks for EB and BoD Compensation[39]

Moreover, 82% of the companies that took part in the survey stated that their management compensation is oriented to the compensation level of companies of the same industry and 54% take into account the management compensation paid in companies of comparable size. Interestingly, using companies of comparable profitability as benchmarks for management compensation seems rather exceptional – this is only done in 15% of the participating companies in the survey (KPMG, 2006).

The proportional use of these non-regional benchmarks for compensation determination is illustrated in Figure 7. The figures indicate that compensation setting is strongly influenced by industry association, even though less for the management board compensation than for the board of directors' compensation, and that company size is an important benchmark for compensation setting at the executive board level.

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[39] Source: KPMG & Institut für Accounting, Controlling und Auditing of the University of St. Gallen (2006).
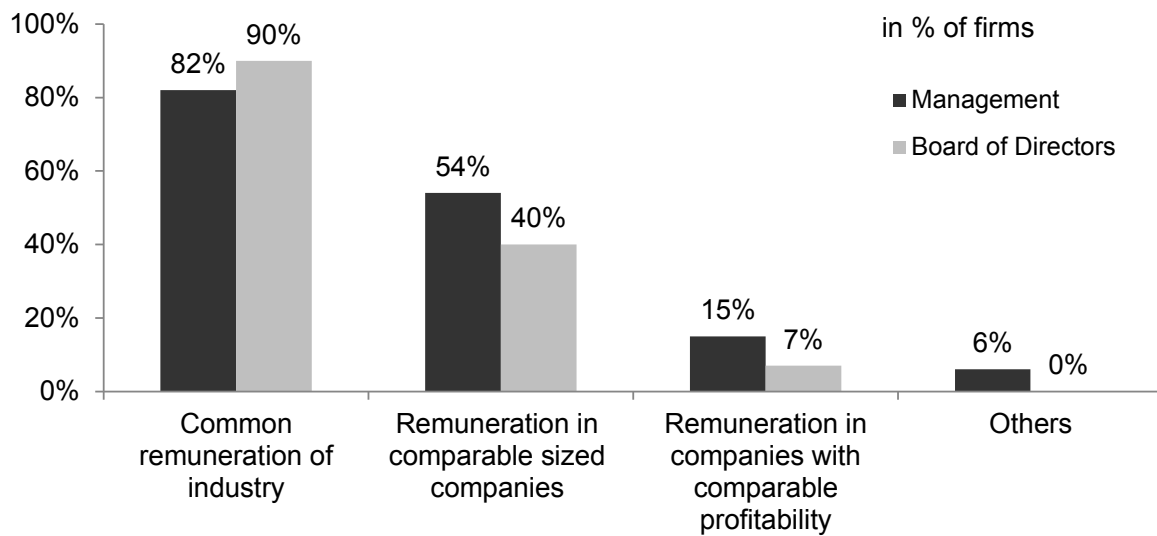
Figure 7: Non-Regional Benchmarks for EB and BoD Compensation[40]

Compensation Structure

Executive compensation can be divided into a fixed part and a variable part. Total compensation is usually made up of three components: Firstly, cash compensation which contains salary (fixed) and bonus (variable); secondly, long-term incentives (variable) such as stock options and other deferred compensation; and thirdly, perquisites and supplementary benefits which are fixed non-cash rewards such as insurance coverage or company cars (O'Reilly et al., 1988: 258).[41]

According to Stern and Peck (2003), fixed salary makes up 59% (median) of total compensation of Swiss executives, but the annual bonus also constitutes an important proportion of total compensation.[42] However, variable proportions of total compensation vary strongly, as can be seen when comparing figures for SMI and

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[40] Source: KPMG & Institut für Accounting, Controlling und Auditing of the University of St. Gallen (2006).

[41] For the definitions of short-term, long-term and total compensation which will be used in the empirical analyses, compare Chapter 3.1.2.

[42] Ethos (2009: 5) notes that the structure of management compensation in Switzerland has not changed notably within the last years, except for the compensation in the financial services industry where the variable compensation proportion decreased clearly during the last years. This decrease in variable compensation in the financial services industry is certainly strongly connected with the recent financial crisis.

SMIM companies[43] based on a study by PricewaterhouseCoopers (2012a).[44] The composition of total CEO pay is illustrated in Figure 8 for SMI firms and in Figure 9 for SMIM firms. While companies of both indices show much lower proportions of fixed compensation (base salary plus other payments) of significantly less than 50% on average, it has to be noted that proportions of the compensation elements also differ clearly in SMI and SMIM firms: The proportion of fixed CEO compensation in SMI firms is significantly lower than for CEOs of SMIM firms. In line with this, the base salary is relatively low compared to variable compensation, especially in SMI firms.[45]

Long-term incentives are especially important and account for the largest fraction of total CEO compensation in SMI companies (cf. Figure 8). In SMIM firms, long-term incentives and base salary tend to be more equally weighted (cf. Figure 9). Ethos (2011: 5, 26) notes that within the previous years, the number of long-term participation plans had increased, but up to then, only few stock or option plans made pay-outs dependent on the achievement of specified goals, even though making these pay-outs dependent on target achievement would contribute to set stronger incentive effects and strengthen the pay-and-performance link. Yet, the majority of participation plans implemented in financial services firms make use of performance criteria, whereas firms belonging to other industries tend to employ long-term participation plans without performance criteria which solely aim at employee retention (Ethos, 2012: 8).

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[43] The compensation structure in SMI and SMIM companies is especially relevant for this dissertation, as the sample used for the empirical part is made up solely of SMI and SMIM firms.

[44] PricewaterhouseCoopers uses the compensation figures disclosed in the firms' annual reports without making any adjustments (PricewaterhouseCoopers, 2012a: 3).

[45] This is especially the case in the Swiss financial services industry, where variable compensation accounts for over 80% of total executives' compensation in SMI companies (Ethos, 2010: 4).
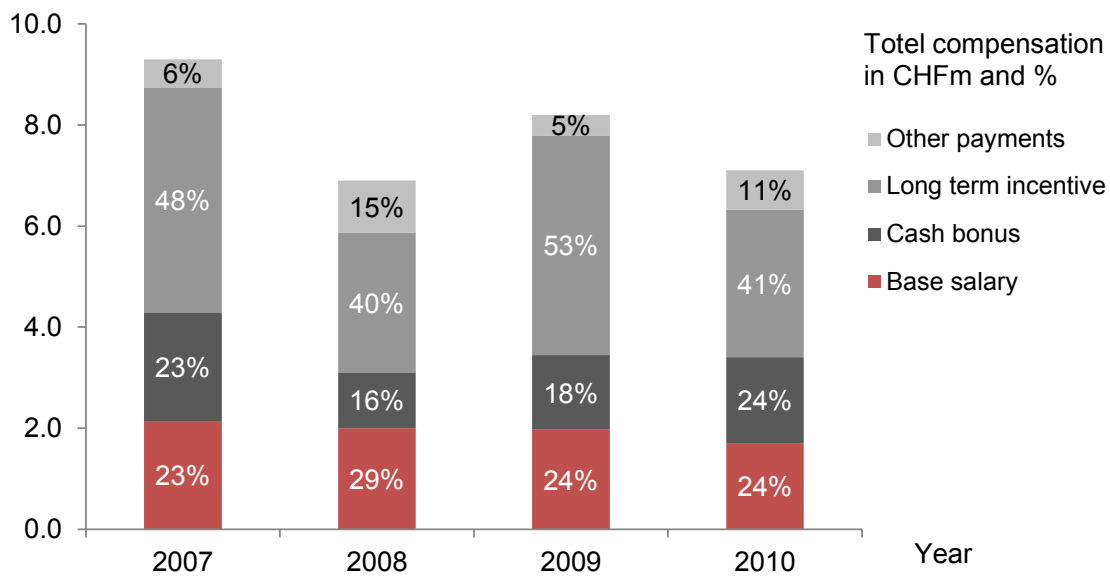
Figure 8: Total CEO Compensation Structure for SMI Firms[46]
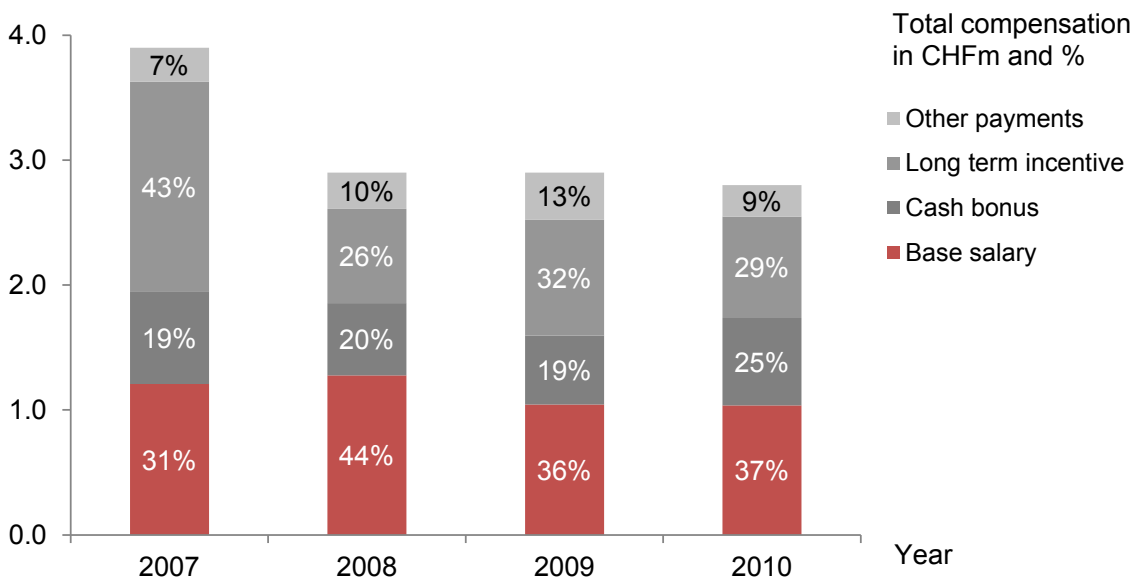
Figure 9: Total CEO Compensation Structure for SMIM Firms[47]

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[46] Source: PricewaterhouseCoopers (2012a: 14). The total CEO compensation figures for SMI firms and the years illustrated in the table are as follows: 2007: CHF 9.3 million; 2008: CHF 6.9 million; 2009: CHF 8.2 million; 2010: CHF 7.1 million.

[47] Source: PricewaterhouseCoopers (2012a: 15). The total CEO compensation figures for SMIM firms and the years illustrated in the table are as follows: 2007: CHF 3.9 million; 2008: CHF 2.9 million; 2009: CHF 2.9 million; 2010: CHF 2.8 million.

Additionally, PricewaterhouseCoopers (2012a) analyzed the composition of executive compensation in SMI and SMIM companies, split up into CEO compensation and TMT compensation. Figure 10 represents the fractions of the total compensation components for CEOs of SMI firms, TMTs of SMI firms, CEOs of SMIM firms and TMTs of SMIM firms in a comparative percentage illustration for the year 2009. Variable compensation (cash bonus plus long-term incentives) exceeds the base salary for CEOs of SMI and SMIM firms, as well as for TMT members of SMI firms, and still accounts for more than 40% of total compensation of TMT members in SMIM companies. On average, CEOs have larger variable compensation proportions than the other TMT members. Long-term incentives constitute especially large compensation fractions for CEOs and TMT members in SMI firms.
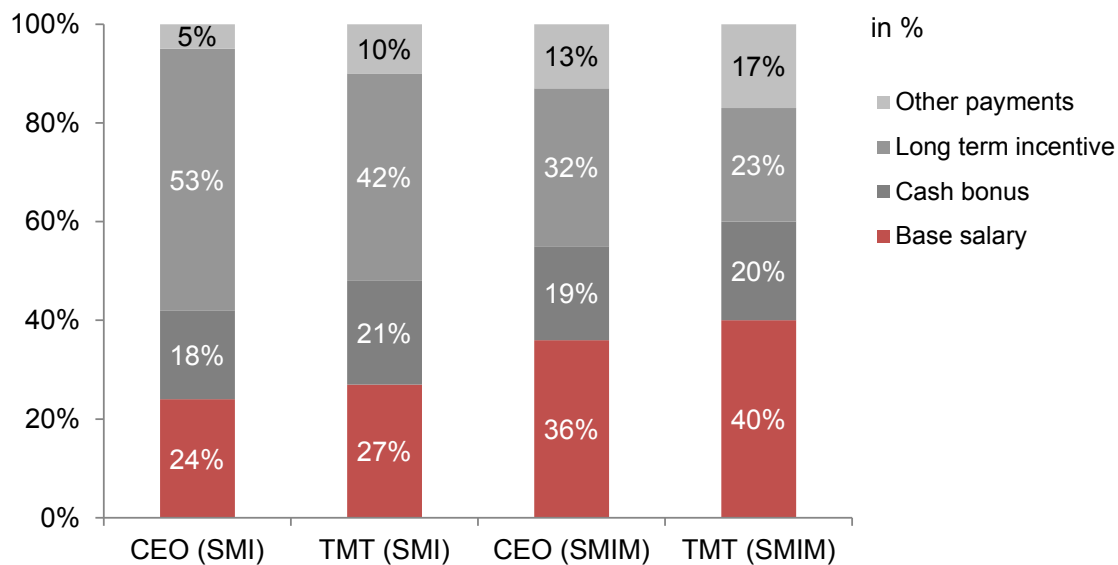
Figure 10: CEO and TMT Compensation Structures in 2009[48]

Besides the differentiation into CEO versus TMT and SMI versus SMIM companies, the industry association has a notable influence on the structure of CEO and TMT compensation, especially with respect to differences of the banking sector as already indicated above. This is also reflected in the selected approach by Ethos to differentiate in its reports between companies of the financial sector and companies of other sectors.[49]

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[48] Source: PricewaterhouseCoopers (2010: 12).

[49] Cf. Ethos reports (2008–2012).

In 2011, companies in the financial sector differed from other firms, for example, in their higher proportion of variable compensation of 75% of total compensation in SMI firms, and a reduction of 26% in total compensation sums of the non-CEO TMT members, whereas these compensation sums in other industries increased by 8% (Ethos, 2012: 3–4). Furthermore, CEO compensation gaps in financial services firms on average tend to be significantly lower (Ethos, 2012: 5).

> **Conclusion:** On an international level, Switzerland has one of the highest average CEO compensation levels. CEO total compensation sums comprise a higher proportion of variable compensation than total compensation sums of the other TMT members. Average base salary is well below 50% of the total compensation for SMI and SMIM executives. Compensation is mostly benchmarked with firms of the same country and industry, but firm size is also an important criterion. Compensation practices in financial services companies differ significantly from compensation practices of companies in other sectors.

Compensation Transparency Regulations

The level of compensation transparency in Switzerland is not exemplary compared to international standards. This has not improved much in the past few years and most companies only publish information that is required by law (Ethos, 2009, 2010, 2011: 5, 15–16).

However, the legal publishing requirements have strengthened lately: In October 2005, the Swiss regulator has taken action to improve transparency of compensation by passing a new act in the Swiss Code of Obligations ("Obligationenrecht" [OR]),[50] which regulates transparency of compensation information for the management and the board of directors. The new act (Art. 663b[bis] OR) has been in force since January 2007 and states that publicly traded companies have to declare in the appendix to the

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[50] The Swiss Code of Obligations is a law that is valid for all companies with the legal form of "Aktiengesellschaft (AG)" (publicly traded companies). Thus, it applies to all SMI and SMIM companies.

balance sheet all direct and indirect compensation paid to current and past[51] members of the management, the board of directors, and the advisory board members, as well as compensation paid to people that are close to them and which is not usual in the market.[52] In this connection, it is also required that the sum paid to the highest earning member of the executive board (with indication of name and function of the recipient), as well as the total compensation sum of the other executive board members as a whole is published (cf. Art. 663b^{bis}, 4 OR).[53]

SIX Swiss Exchange published the RLCG (Richtlinie Corporate Governance), another guideline that is binding for SIX listed companies such as SMI and SMIM firms, and first came into effect in July 2002. The original guideline included the mandate to publish aggregated compensation sums for executives of the board of directors and management board, members of the non-executive board of directors, as well as former members of these groups. Furthermore, the compensation of the highest paid member of the board of directors had to be indicated. In January 2007, a revised and simplified version of the guideline came into force which adapted its regulations concerning compensation transparency to eliminate overlaps with the then new article of the Swiss Code of Obligations. The new version has eliminated the former publication requirements for compensation sums and refers in Chapter 5 of the guideline ("Compensation, participations and loans") only to topics not covered in the OR article. It stipulates that the content and the process of determination of compensation and participation programs have to be disclosed, both for members of the management board and those of the board of directors, and that issuers that have their place of business not in Switzerland, but are quoted on the SIX Swiss Exchange and not in their home country, have to apply Article 663b^{bis} OR accordingly (SIX Swiss Exchange, 2002, April 17; 2006, August 2).

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[51] Compensation for past members only has to be declared if it is connected to their work as an organ of the company or if this compensation is not usual in the market.

[52] The legal definition of compensation includes all kinds of fees, royalties, participation in sales or company results, remuneration, participations, options and so on. Also included are termination pay, guarantees, cancellation of debt, expenses for financial securities as well as compensation for additional work (cf. Art. 663b^{bis}, 2 OR). Moreover, credits provided have to be declared under certain circumstances (cf. Art. 663b^{bis}, 3 OR).

[53] For the board of directors and the advisory board, in addition to the total sum, also the individual compensation sum for each member has to be published along with their function (cf. Art. 663b^{bis}, 4 OR).

Finally, the Swiss Code of Best Practice has also to be mentioned with respect to influential regulatory frameworks relating to compensation transparency issues. Even though the Swiss Code of Best Practice is solely a non-binding guideline based on the principle "comply or explain," it has become so well-established in Swiss business life that it is respected by most of the SIX-listed companies. Like the SIX corporate governance guidelines, it came into force in July 2002, and was updated with respect to compensation disparity in 2007. This update added detailed descriptions in Appendix 1 to the already existing compensation-related articles (Articles 25 and 26). However, only Appendix 1d (Article 10) provides information on transparency issues.[54] As in the Swiss Code of Obligations, the information to be provided in the compensation report according to the Swiss Code of Best Practice contains information on the compensation of the board of directors in total as well as of its individual members, the management as a total and the highest paid individual. This publication requirement is therefore set explicitly by two regulatory decrees discussed in this review on transparency regulations. Furthermore, the Swiss Code of Best Practice demands that an explanatory statement regarding compensation increases or decreases compared to the previous business year should be made.

These regulations and guidelines form the basis for the current state of compensation transparency in Switzerland. By abiding by those laws, companies usually indicate the components of compensation and the compensation of the highest paid member of management as well as the total sum of top management compensation. But as the tables in the annexes of Ethos (2008) show, only very few companies disclose more information than the legally required minimum. Thus, it is not common to publish individual compensation sums of members of the executive board.

As the analyses by Ethos (2011) show, compensation transparency is slowly increasing in SMI and SMIM firms. The number of companies which publish

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[54] Articles 25 and 26 deal with the establishment of a compensation committee comprised mainly of independent, non-executive members and responsible for setting the compensation packages of the highest management level within a company. The description of the duties of this committee mentions specifically that the compensation committee should pay attention to the market and performance equivalence of executive compensation, thus making an explicit link with the pay-for-performance idea. It also postulates that compensation should depend on sustainable value creation for the company as well as on individual contributions, and should avoid false incentives.

additional compensation information beyond the required minimum, such as the performance criteria applied for bonus attribution, the percentage of bonus attributed based on individual performance criteria, or target and maximum bonus sums, has clearly increased from 2007 to 2010. Only the transparency of individual compensation sums of members of the executive board was still unchanged on a low level by 2010.

These regulatory publication requirements may be useful for a better overview of the level of compensation in Switzerland and provide the data basis for the calculations in the empirical part of the dissertation. However, it seems questionable whether such requirements will help to limit or lower the sometimes vast compensation sums paid. According to Leibfried (2008), studies in other countries have shown that these kinds of rules for transparency do not limit the height of compensation, but rather lead to a contrary effect. He traces this to the fact that published compensation levels may be used as a signaling instrument for the quality of management, wherefore higher compensation sums are considered as an indication for higher quality managers.

> **Conclusion:** Regulatory decrees require the publication of the compensation sum of the highest earning executive board member as well as of the executive board as a whole. Individual compensation sums of TMT members are usually not published. Increased compensation transparency does not automatically lead to lower compensation levels, but compensation sums might even be increased to signal the quality of management.

The Minder Initiative

The Minder Initiative was a Swiss "initiative against abusive salaries" which was accepted in public vote on March 3, 2013, with almost 68% of yes votes (NZZ, March 3, 2013). It applies to Swiss limited companies quoted at stock exchanges in Switzerland or abroad and stipulates, among other things, the following duties of shareholders at the general assembly: 1) to vote annually on the compensation sums paid out to the board of directors, the management board and the advisory board, and 2) the annual election of the chairman of the board of directors and of the other

members of the board of directors one by one. Furthermore, the text of the initiative prohibits termination pay or compensation in advance, as well as premiums for the acquisition or sale of a company. Violations of these regulations may be penalized with up to three years of imprisonment and up to six annual compensation sums (Initiativtext[55]). These criminal law provisions are especially controversial and also unnecessary, as argued by Nobel (2012: 1). In case the Minder Initiative had been rejected, a detailed counterproposal formulated by the Parliament would have automatically come into force. This counterproposal contained provisions which were quite close to the original initiative in terms of intent, but were more oriented to practicality and safeguarding the interests of the Swiss business location (Nobel, 2012: 3). Since the Minder initiative still has to be translated into law, it is at the time of writing this dissertation not yet clear, what concrete regulations will be derived from it.

2.1.2   Corporate Governance

While management compensation by itself already constitutes a corporate governance instrument, this chapter will highlight further corporate governance characteristics of Swiss companies, as those will be touched in the subsequent empirical analysis.

According to Hilb (2006: 46), the monistic board system is widespread in Switzerland. In this system, the supervisory board and the management board overlap. This can be the case in two ways: Firstly, if several members of the management board are simultaneously part of the supervisory board which is frequently the case in family-owned firms and is called the "executive board model." Secondly, another form of monistic board system is CEO duality. This means that the CEO is at the same time the chairman of the board of directors, while most of the other board members are external and independent. This so-called "non-executive board model" prevails in the US. Meanwhile, this model has also found its way into Swiss companies, but occurs still much less frequently in Switzerland than in the US (Ruigrok, Peck, Tacheva, Greve, & Hu, 2006: 131). The advantages of a non-executive board model are related to better efficiency and coordination (Schmid & Zimmermann, 2008), while these models display potential disadvantages such as

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[55] The text of the initiative was retrieved on May 3, 2013, from http://www.abzockerinitiativeja.ch/wp-content/uploads/Initiativtext.pdf.

power concentration in the person of the CEO and paucity of critical stakeholder feedback (Hilb, 2006: 47).[56]

Hilb (2006: 45) mentions the "dual board system" as a third possible board system: In cases of dual board systems, the supervisory board and the management board have to be totally separated, which is to say no personal overlap is admitted. The dual board system also occurs in Swiss companies and is even compulsory for banks. Figure 11 illustrates these board models.
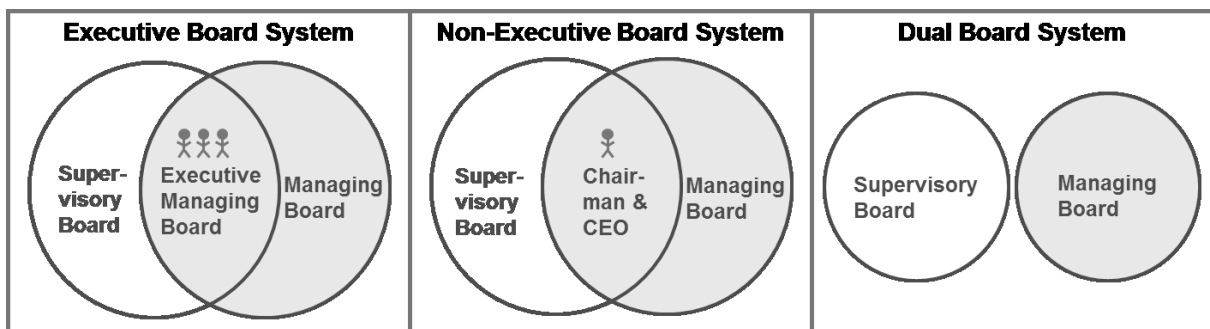
Figure 11: Illustrations of Board Systems[57]

Since the majority of research on CEO-TMT pay disparities was conducted in the US context, it is especially interesting to compare the Swiss corporate governance system to that of the US. Besides the predominant board systems, another clear difference between the systems is the degree of ownership concentration. While the shareholdings are relatively widespread in the United States, ownership is highly concentrated in Switzerland, frequently with families or individuals who founded the firm or inherited large share proportions (Hertig, 1998; La Porta, Lopez-de-Silanes, & Shleifer, 1999). Thus, these major shareholders are in a position to significantly influence both the composition and the activities of management and the board of directors. Additionally, banks take a more central role as a firm control function for Swiss publicly traded companies than in the US (Weichsler, 2009: 43).

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[56] Interestingly, Schmid and Zimmermann (2008) also found that CEO duality is associated with higher equity holdings of the CEO, which, in turn, is linked with higher firm value (up to a point of 40–50% of equity holdings). These findings are in line with their hypothesis that additional corporate governance mechanisms might be introduced to mitigate agency problems in case of CEO duality.

[57] Source: Hilb (2006: 45–47).

This can be traced to their important role as credit providers, their larger shareholdings in public firms (also compared to banks in the US) as well as their potential to act as voting representatives for private shareholders (Nestor & Thompson, 2001). Overall, this speaks in favor of stronger management control mechanisms implemented in Switzerland than in the US.

> **Conclusion:** Corporate governance systems of Swiss firms differ notably from corporate governance systems of US firms, with Swiss firms seeming to have stronger management control systems in place. CEO duality occurs much less frequently in Switzerland than in the United States.

2.1.3 Culture

Hilb (2009) highlights that there is a country-specific dimension to compensation design which can be traced to differences with respect to national cultures. He states that cultural attitudes toward hierarchy influence the question of *"what degree of pay differential is acceptable"* (239)? Consequently, cultural factors might also impact the link of CEO-TMT compensation disparity and both resulting individual employee performance and firm performance, and therefore, will be broached within this dissertation. As mentioned above, most past research has been conducted in the US context. Therefore, especially the differences between the Swiss and the US culture are of interest in order to draw inferences on the potential impact of culture on the researched relationship in Switzerland.

Hofstede (1984: 83) elaborated several dimensions that describe cultural differences between various countries, with particular focus on cultural traits that influence behavior at work. Of Hofstede's cultural dimensions, notably two parameters might be expected to be linked to tolerance of pay inequality – the "power distance index" and the "individualism index." The power distance index illustrates *"the extent to which the members of a society accept that power in institutions and organizations is distributed unequally"* (Hofstede, 1984: 83). According to Hofstede, power distance influences a community in numerous ways: It impacts the behavior of both more and less powerful individuals, and by determining how inequalities between people are treated, it affects how institutions and organizations are constructed. While in

countries with a large power distance, hierarchical differences are tolerated without asking for justifications, people in countries with a small power distance are interested in equal distribution of power and deviations from this equality principle need to be thoroughly grounded (Hofstede, 1984: 83). Since larger compensation packages could be regarded as a reflection of higher power (Pfeffer, 1992), it may be induced with regard to intra-firm pay differences that those should be higher in societies with a larger power distance.

The individualism index depicts people's attitude toward a society with less strong social ties among its members, in which individuals care primarily about the wellbeing of themselves and their closest family members. The opposite of individualism is termed "collectivism" which is characteristic of interdependent societies with strong social ties. In such societies, relatives, clan members, or other associated members take care of individuals who, in return, give them unconditional loyalty (Hofstede, 1984: 83). The assumption to be deducted here with respect to pay differences might be that more collectivist societies display smaller pay differences than more individualistic societies, since well-being of the larger entity has a higher weight in the former societies.

These considerations have also been partly supported by Tosi and Greckhamer (2004) who examined how Hofstede's cultural dimensions are related to CEO compensation in different countries. They showed that power distance is positively related firstly, to total CEO compensation, secondly, to the ratio of variable to total compensation, and thirdly, to the ratio of CEO compensation to the compensation of the lowest level employee. Furthermore, their analyses showed that individualism is positively related to total CEO compensation as well as to the proportion of variable compensation to total compensation. Overall, Tosi and Greckhamer (2004) concluded that CEO compensation reflects most strongly the power distance present in a society, as power distance was related to all CEO compensation dimensions of their study.

How does power distance and individualism vary between the countries (the US, Switzerland, and Japan) discussed in Chapter 2.1.1 on compensation levels?

Table 1 shows the power distance and individualism scores for these countries and in parentheses, the corresponding rank in the field of countries researched[58] as well as a classification to the lowest (L), middle (M), or highest (H) group. To increase comparability, the other two German-speaking countries neighboring Switzerland (Germany and Austria) have also been included in the figure. To illustrate how to read the table, the power distance scores for Austria are interpreted: Austria scored 11 points in the power distance category, which put it on rank 53 (out of 53 countries and regions). Therefore, Austria is in the lowest (L) group of countries in terms of power distance.

Country	Power Distance	Individualism	Uncertainty Avoidance	Masculinity
Austria	11 (53/L)	55 (18/H-M)	70 (26-27/M)	79 (49/L)
Germany[59]	35 (42-44/L)	67 (15/H)	65 (23/M)	66 (41-42/L)
Japan	54 (33/M)	46 (22-23/M)	92 (44/L)	95 (50/L)
Switzerland	34 (45/L)	68 (14/H)	58 (19/M)	70 (46-47/L)
United States	40 (38/L)	91 (1/H)	46 (11/H)	62 (36/M-L)

Indications in parentheses are rank within countries researched and group classification: L=lowest group; M= middle group; H = highest group

Table 1: Hofstede's Country-Specific Cultural Dimension Indices[60]

However, when comparing both power distance and individualism scores with the CEO compensation figures discussed in Chapter 2.1.1, the findings of Tosi and Greckhamer (2004) are not reflected one-to-one in the data. While CEO compensation packages are much larger in the US and in Switzerland than in Japan, the latter has the highest power distance of the three countries. Thus, based on this small country

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[58] Overall, the study contained 50 countries and three regions representing several other countries, i.e. East Africa, West Africa, Arab countries (Hofstede, 1984: 84).

[59] Since Germany was still separated at the time when the study by Hofstede was conducted, Germany refers to the Federal Republic of Germany, not the German Democratic Republic (Hofstede, 1984: 85).

[60] Source: Based on Hofstede (1984: 85).

cutout, a higher power distance does not seem to always be associated with higher CEO compensation sums, and therefore, with higher tolerance of unequal pay distributions. With respect to individualism, the picture is different: While the US has the highest individualism score of all sample countries, also Switzerland is located in the top third, and Japan follows slightly behind in the middle field of the sample countries. Therefore, there is some evidence based on this small-scale analysis of Hofstede scores for the hypothesis that a higher degree of individualism might be associated with the presence of more unequal pay distributions.[61]

The Globe study constitutes another seminal study on cultural traits and was published in 2007. This study additionally differentiates between cultural practices and cultural traits, demonstrating that these do not necessarily coincide. In terms of power distance, the study reveals a gap for Switzerland between the relatively high perceived power distance in practice and a considerably lower power distance desired owing to cultural traits. Yet, it is noted that this degree of difference can be observed all around the world and is, therefore, not unique to Switzerland, even though the low desired power distance fits in well with the Swiss cultural roots founded on *"democracy, freedom, and self-determination"* (Weibler & Wunderer, 2007: 265). However, the study concludes that *"perceived reality in Switzerland reveals serious differences in interpersonal relations that are experienced as an excessive power distance"* (282). The desired low power distance is reflected in the conceptions of outstanding leadership, too. While outstanding leaders are expected to show *"value, performance and people orientation (fair, competent and team-oriented)"* (275), they are supposed to *"avoid everything that puts them in the center of attention or leads to solitary decision making"* (275). It is mentioned in this respect that hierarchy is accepted, but only when going along with *"humane role taking, minor claim for authority and very low formal distance"* (282). Furthermore, outstanding leadership involves a *"high ability for consent and modest manners"* (282). Switzerland shows the highest practiced performance orientation of the 61 countries surveyed in the Globe study, but

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[61] However, it has to be noted that this is a very simplified comparison, as it disregards other cultural and non-cultural influencing factors on compensation level and structure. Consequently, the results of this comparison may of course not be considered a counter-argument for the validity of the results by Tosi and Greckhamer (2004), but rather imply that simple comparisons of cultural dimensions and pay levels have only very limited explanatory power.

scores still higher on the "should be" dimension of the value performance orientation (Weibler & Wunderer, 2007: 268). As a whole, these descriptions of the Swiss culture show that it is a rather low-key culture, yet characterized by a high performance orientation.

How does the US culture compare to the Swiss culture based on the description in the globe study? The US scores very high on performance orientation, too, both with respect to actual practices and cultural values. Besides, with respect to power distance, the US scores are fairly comparable to Switzerland. Nevertheless, these dimensions seem to manifest themselves differently in cultural practices. Hoppe and Bhagat (2007) note: *"Americans' primary mode of distinguishing themselves is their own individual achievement, which makes them stand out and for which they expect tangible, visible rewards"* (509). If managers advance in the corporate hierarchy on the strength of their individual achievements, the resultant inequality is considered justified. In line with this, status symbols are more willingly shown in the US culture (Hoppe & Bhagat, 2007: 509) than, for example, in the Swiss culture. The importance of individualism as a US value is highlighted by the fact that managers in the study even express the desire for still more individualism over collectivism, which is against the worldwide trend toward less individualism.[62] Therefore, the US culture seems to be highly performance-oriented just as the Swiss culture, but this performance-orientation manifests itself quite differently, much more openly than in Switzerland. Based on this comparison, it seems likely that large CEO compensation sums should be more compatible with the US culture than with the Swiss culture.

However, it also has to be reflected finally to what extent cultural traits of single countries nowadays still affect or should affect firm culture and especially pay setting decisions in multinational corporations. As Hilb (2007: 9) pointed out,[63] internationalization has long penetrated large Swiss firms. This is also shown clearly when looking at the composition of top management teams or the board of directors of many Swiss firms. For example, within the Executive Board of Nestlé, one of the largest and most international Swiss companies, there were 11 nationalities present

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[62] Hoppe and Bhagat (2006: 508) note that in 70% of the countries surveyed in the Globe study, people desire less individualistic societies.

[63] Compare also Chapter 1.2.2.

within a group of 13 executive board members in the year 2010. Facing such international team compositions, it is debatable how far pay setting procedures for the executive board are still affected by cultural factors of the country in which the firm is based or what weighting should actually be attached to the use of benchmarks of firms in the same country.[64] As noted before in this respect, Hilb (2007: 9) also observed an increasing influence of US compensation practices on Swiss executive board pay setting[65] which might contribute to a weaker link of cultural traits and observed pay setting practices.

Conclusion: Cultural values manifest themselves differently in Switzerland and the US. While Switzerland seems to be a culture of very modest and low-key attitudes, the US culture prefers visible rewards and distinctions for their accomplishments, traits also reflected in the notion of exemplary leadership. In line with growing internationalization, it might be questioned to what extent compensation practices in multinational firms are or should be in accordance with cultural values of a firm's home country.

2.2 Theories of Pay Distribution and Firm Performance

The problem of setting compensation in the right way can be traced back to the separation of ownership and control of firms which is described in the agency theory by Jensen and Meckling (1976). This theory differentiates between the owners of a company (or shareholders) who act as principals, and management members who are the agents. The principals hire the agents to *"perform some service on their behalf which involves delegating some decision making authority to the agent"* (Jensen & Meckling, 1976: 308). The agents, though, do not necessarily have the same interests as the principals, e.g. they might be more interested in maximizing their own welfare than in taking decisions to maximize company value, and as a result, the agents might profit at the expense of the company and the principals. Thus, to prevent or at least minimize this kind of undesirable behavior, the principals need to control the agents

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[64] Cf. Chapter 2.1.1.

[65] Cf. Chapter 1.2.2.

(Werner & Tosi, 1995). Yet, controlling the agents is associated with so-called agency costs, which accrue in the process of collecting information about and monitoring the agents. Since the principals are normally not able to perfectly monitor the agents, another approach to prevent unwanted behavior is to try to align the interest of the agents with the interests of the principals. This can be achieved by creating incentives, frequently through the design of executive compensation schemes (Garen, 1994). By integrating observable performance measures into the compensation contract and basing the attribution of compensation to the executive on the achievement of these specified performance goals, the firm owners can try to align the interests of the agents with their own interests (Conyon et al., 2001). Therefore, agency theory constitutes a basic idea, stipulating that a compensation design can have motivational effects on employees which may influence firm performance.

In research on motivational pay design models, two main compensation distributions have received long-standing attention of researchers.[66] Already in the year 1923, Hamilton and Macy discussed "divergent" and "uniform" pay distributions; however, their argument was not based on motivational aspects. Instead, they argued that *"excess ability, knowledge, skill, training, diligence, or whatnot, possessed by its recipient over the common laborer"* (115; cited in Bloom, 1999: 26) must be reflected in employee pay.

Nowadays, the two contrasting pay distributions are often described as hierarchical and compressed distributions (cf. for example Lazear, 1989; Eriksson, 1999; Bloom & Michel, 2002; Main et al., 1993). Hierarchical pay distributions describe systems in which a large proportion of pay is attributed to few levels in the organizational hierarchy, mostly among those positions near the top of the organization. This results in a less equal or more dispersed pay structure.

The underlying assumption of this distribution scheme is that differences in rewards lead to higher effort of individuals and, as a result, increase organizational performance. Hence, this theory is referred to as *tournament theory* (cf. Chapter 2.2.1).

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[66] As this thesis focuses on motivational pay models, other important theories pertaining to compensation setting, such as the managerial power model (Lambert, Larker, & Weigelt, 1993), are not discussed in detail in this study.

Compressed pay structures, on the contrary, describe pay systems which distribute pay more equally. Advocates of such pay systems presume that more equal pay is conducive to higher levels of cooperation which positively impact performance. This theory is labeled *equity theory* (cf. Chapter 2.2.2).

As already observable in these short characterizations of the competing models, the preoccupation with equality and inequality of compensation attribution highlights that within such motivational pay design models, less weighting is given to absolute pay levels and more to relative pay or the distribution of pay. In the following, these two pay distribution theories will be discussed in detail since they build the theoretical basis for the large majority of CEO-TMT compensation disparity studies as well as for the hypothesis generation of this dissertation. Additionally, a third theory will be introduced, the *team player theory*. It constitutes a combination of the positive aspects of both tournament theory and equity theory.

2.2.1 Tournament Theory

Tournament theory (Lazear & Rosen, 1981) favors hierarchical pay distributions and provides a possible explanation for the large pay disparities between the CEO and the executives on the next level of the organizational hierarchy, which are not adequately accounted for in neoclassical theory, arguing on the basis of marginal products. Lazear and Rosen (1981: 847) note in this respect: *"On the day that a given individual is promoted from vice-president to president, his salary may triple. It is difficult to argue that his skills have tripled in that one-day period, presenting difficulties for standard theory ... It is not a puzzle, however, when interpreted in the context of a prize."* Hence, Lazear and Rosen (1981) assume that executives within an organization engage in a competition for promotion in the corporate hierarchy. They further state that the prize for winning the competition on one level of the tournament is the higher level of compensation which is awarded in the new, next higher position. Pay disparity, therefore, can be considered as an incentive system to perform well in order to succeed in the tournament for promotion. Within this tournament, employees at the lower end of the corporate hierarchy participate in a *"self-financing quasi lottery (rank-order tournament)"* (Main et al., 1993: 607): They accept wages below their expected marginal product in order to have the chance to win in the tournament for promotions and profit from increasing wage gaps toward the top, with the main prize

being the lavish salary for the top executive's job (Main et al., 1993: 607). This implies that the employees on the lower level give up part of their compensation that feeds into the main prizes of the tournament, the compensations at the top (O'Reilly et al., 1988: 257).[67] Rosen (1986: 701) explains that in this kind of tournament, when the winner on one level moves on to the next level, they do not only get the reward of a higher salary, but also the chance to participate in the competition for promotion on the next level, which is associated with an even higher compensation. This chance to continue in the tournament can be considered an option. However, Rosen (1986) also notes that the higher an employee moves in the corporate hierarchy, the less potential tournaments are still left, as a result of which the value of the imaginary option decreases. In order to prevent successful participants in the competition from reducing their efforts and being satisfied with their past achievements, the prizes at the top have to be of disproportionate value (Rosen, 1986) to compensate for the lost option value and to ensure ongoing motivation of the contenders. By instituting high compensation increases for the last steps in the company hierarchy, the career ladder of the executives is extended (Rosen, 1986: 701). This argument explains why *"compensation is an increasing function of organizational level"* (Lambert, Larker, & Weigelt, 1993: 439). However, the losers are excluded from the tournament and their career path within the organization is cut. They will remain on the same salary level or need to leave the company (Bloom & Michel, 2002: 34).[68]

This implies that compensation is not merely awarded according to an individual's output or realized marginal product, but is rather dependent on their rank within the organization. As Rosen (1986: 714) puts it: *"In examining the relation between wages*

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[67] Thus, the tournament prize should increase in tandem with the number of participants, as O'Reilly et al. (1988: 261) remark: *"Given this fact, then it should follow that, in general, the more players in the tournament, the larger the prize should be. In the organizational context, this should mean that, after controlling for other possible economic determinants of CEO compensation, the more vice presidents, the larger should be the observed gap between the CEO's salary and bonus and those of the vice presidents."* Yet, empirical support is inconsistent: While Main et al. (1993) and Eriksson (1999) find support for this proposition, O'Reilly et al. (1988) observe that a higher number of vice presidents corresponds to a smaller compensation gap between vice presidents and CEO.

[68] Yet, Main et al. (1993: 625–626) contradict this statement. They remark that data as well as sociological and psychological research rather supports the notion that losers in the promotion tournament may compete again later for the same promotion and may subsequently even overtake the previous winner in further promotion tournaments.

and marginal products, the concept of marginal productivity must be extended to take account of the value to the organization of maintaining incentives and selecting the best personnel to the various rungs, not only the contribution at each step." Main et al. (1993: 607) also note that for the purpose of creating a proper incentive structure, it may be required to install large pay differences among the top executive ranks. This also means that even if the pay of a firm's top executive might be disproportionate to their marginal product, it may still *"be economically efficient"* (Main et al., 1993: 606–607). Rosen (1986) states that *"payments at the top have indirect effects of increasing productivity of competitors further down the ladder"* (714). All in all, this may justify the large gaps such as between the salary of the top executive within a company and the next level of executives which is frequently observed in practice (O'Reilly et al., 1988: 260). The argument demonstrates why, according to tournament theory, compensation increases as a function of rank (Lambert et al., 1993; Main et al., 1993). It also implies that a tournament pay structure can be most easily detected looking at the large compensation gaps at the top of a company (Main et al., 1993: 608).

So, what are the positive aspects or advantages if tournament theory holds in reality and what constitutes the disadvantages, shortcomings or challenges with respect to this theory? If tournament theory holds, the main advantage is certainly that it provides a means by which the principals can influence the level of effort exerted by the agent, and thus, to a certain degree, firm performance as well. According to tournament theory, less compressed pay distributions increase performance since pay disparity induces individuals to increase their efforts, and the sum of efforts of a firm's employees should ultimately lead to a higher firm performance (Bloom, 1999: 26). In this respect, Ang et al. (1998) say that *"large pay differentials will motivate all senior executives, who consider themselves as potential candidates for the CEO position, to exert maximum effort"* (337). Tournament pay settings can even be employed in such a way *"to ensure that agents expend the 'correct' or optimal amount of effort"* (Conyon et al., 2001: 806). For example, by increasing the size of the prize or the efficiency of monitoring, the agents can be incentivized to enhance efforts (Prendergast, 1999: 34).

Another major advantage of large compensation disparity is that such pay settings *"promote the survival and retention of a firm's star (that is, most talented) managers"*

(Bloom & Michel, 2002: 34). In addition, tournament compensation systems are advantageous if monitoring of employee effort or output is costly or unreliable (Lazear & Rosen, 1981: 842). In line with this, Nalebuff and Stiglitz (1983) highlight the advantages of a tournament-oriented pay setting *"in situations where there is imperfect information about the difficulties associated with different tasks, where it is prohibitively costly to observe inputs directly, and where it is difficult to measure the outputs with precision"* (40). Consequently, the evaluation of executives based on an ordinal ranking instead of exactly quantifying their worth may be considerably easier (Green & Stokey, 1983: 364) and may reduce performance monitoring costs (Rees, 1992: 567–568). Green and Stokey (1983: 349) further show that employing a tournament pay setting is a more efficient approach in cases of external economic shocks that impact performance of all employees.

However, there are also several negative issues to mention about tournament theory. A great disadvantage is the workforce instability created as a result of a tournament pay system. This is a result of lower employee commitment to the firm because of a more competitive and adversarial climate among employees (Pfeffer, 1998, as cited in Bloom & Michel, 2002: 34).

Strict tournament theory would also tend to be perceived as demoralizing and unfair by employees on lower hierarchical levels due to the unequal distribution of rewards with overcompensation of the top managers (Pfeffer, 1994: 37).[69]

Moreover, it may be problematic to use promotion incentives in cases where the skills or talents needed to perform well on the next higher level are not perfectly correlated with the skills or talents that are required to be the best performer on the lower level. A mismatch of skills for the higher level position after promotion may be the result. Known as the Peter Principle, this could provocatively be expressed as *"people are promoted to their level of incompetence"* (Baker, Jensen, & Murphy, 1988: 602).

Probably one of the most serious problems of tournament settings is the low incentives for collaboration and the unintentional encouragement of selfish behaviors associated with this. Especially when work is highly interdependent and common

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[69] This is also known as the Matthew effect, according to which more is given to those who already have a lot, while more is taken from those who already have less (Merton, 1973).

effort is decisive for generating output, large pay differentials may be disadvantageous for organizational performance (Deutsch, 1985). According to Eriksson (1999: 4), such work interdependencies exist in many senior management teams. Relating to self-interest, in extreme cases there might be the risk of sabotage among the managers, aiming at gaining a better position in the promotion tournament by working against their rivals since *"workers benefit not only by their own successes but also by their rivals' failures"* (Lazear, 1989: 578–579). Losses in productivity may be the result (Lazear, 1989: 562). Table 2 sums up the advantages and disadvantages discussed above to provide a holistic picture.

Advantages	**Disadvantages**
• Compensation disparity provides a means to induce higher levels of individual effort. Tournament setting may ensure that agents exert the optimal amount of effort. • Tournament setting promotes survival and retention of the best manager. • Costs of monitoring performance are reduced as it is easier to judge executives based on ordinal ranking than on quantitative worth as measured by the difficulty of their tasks, their input and output. • When market shocks are affecting the performance of all executives, tournaments constitute a more effective device to identify superior executives.	• Workforce instability due to lower commitment of employees to the firm as a result of competitive climate and more adversarial social relations. • A tournament pay system can be demoralizing and create feelings of unfairness and reduced satisfaction. • Promotion may not be the appropriate incentive device because there may not be a matching of the skills in one job and the next job after promotion. • Cooperation is discouraged and there is the risk of sabotage among tournament participants.

Table 2: Advantages and Disadvantages of Tournament Pay Settings

2.2.2 Equity Theory

Equity theory (Adams, 1965) favors compressed pay distributions. For a long time, compensation policy-makers considered hierarchical pay distributions as a better solution than compressed distributions, since compressed pay distributions were viewed as carrying the risk of under-rewarding employees on higher job levels, with higher skills and abilities or better performance (Milkovich & Newman, 1996, as cited in Bloom, 1999: 26). However, by now, the advantages of compressed pay distributions have been recognized as well (Bloom, 1999: 26).

Equity theory or theory of wage compression stands in contrast to tournament theory. It assumes that small wage differences between organizational ranks will contribute to eliminate potential disadvantages of tournament settings, such as uncooperative and destructive behaviors, which might result in reduced shareholder wealth (Lazear, 1989) and that the quality of social relations in the workplace will positively impact firm performance (Akerlof & Yellen, 1988: 45).

Even though the advantages of the theory were not acknowledged for a long time, the notion of pay equity had already been dealt with in some early studies. Hicks (1963: 334, as cited in Main et al., 1993: 624) mentioned that for economic efficiency of a compensation system *"it is also necessary that there should not be strong feelings of injustice about the relative treatment of different employees, since these would diminish the efficiency of the team."* He traced that to the fact that feelings of injustice lead to lower levels of loyalty to the organization and hold the potential of counterproductive conflicts.

In the following, the advantages and disadvantages of equity theory will be discussed. Lazear (1989) mentions as advantages of a more compressed pay setting that it is expected *"to preserve worker unity, to maintain good morale, and to create a cooperative work environment"* (561). Bloom (1999) further adds that equity-oriented pay distributions may be of advantage for *"group performance because they may inculcate feelings of fairness and common purpose, foster cooperative, team-oriented behavior, and support common goal orientations"* (26), summarizing findings of Cowherd and Levine (1992), Lazear (1995) and Pfeffer (1994). Pfeffer (1994) mentions in this respect that *"teamwork is fostered by common fate, and common fate is enhanced to the extent that people in an organization fare comparably in terms of*

rewards received" (50). Additionally, there are lower incentives to sabotage coworkers' efforts (Conyon et al., 2001: 808). In the end, equity theory posits that these advantages should manifest themselves in a higher individual as well as organizational performance (Bloom, 1999: 27).

Nevertheless, there is also criticism regarding the pay equity model. One important counter-argument is that *"egalitarianism is not a universal virtue"* (Ang et al., 1998: 339). If there are no monetary incentives to increase one's individual efforts, but pay among executives remains constant irrespective of individual work output, *"it is human nature to free ride on others' effort"* (Ang et al., 1998: 339). Lazear (1989: 561–562) highlights potential negative effects of more equal pay structures on working morale of high performing employees and notes that it is not certain that the increase in morale of other employees will offset this decrease. Ehrenberg and Smith (1994) mention the problem of "topping out," implying that the best performers might seek different employment opportunities once they reach the maximum pay within their organization and choose organizations with less compressed pay distributions.

Table 3 summarizes the main advantages and disadvantages of an equity pay setting.

Advantages	Disadvantages
• Small compensation differences create more harmony among the workforce and good morale, as well as facilitate teamwork. • Employees tend to feel treated fairly. • Employees are aware of a common fate which is conducive to teamwork. • Employees have less incentive to sabotage their co-workers' efforts.	• If top executive pay remains the same irrespective of employees' individual efforts, there is the risk that executives might free ride on the work efforts of others. "Egalitarianism is not a universal virtue" (Ang et al., 1998: 339). • Ambitious high performers might leave the organization for an employer with a more hierarchical pay distribution.

Table 3: Advantages and Disadvantages of Equity Pay Settings

2.2.3   Team Player Theory

While tournament models set high incentives for individuals to exert their best efforts, but as a result run the risk of discouraging cooperation, equity models display lower incentives to further individual efforts, but provide a better foundation for cooperation. Ang et al. (1998: 339) recommend a third alternative theory, the team player model, which combines the positive aspects of both tournament theory and equity theory, and at the same time eliminates their disadvantages. They ground the team player model on the following three assumptions (Ang et al., 1998: 340)[70]:

- Since senior executives of a company are supposed to be team players, those who do not go along with this will be inapt and will not prevail in this setting.

- Both the individual contribution and the contribution to the success of the team as a whole (with the goal of creating firm value) are aspects of an executive's performance which will be taken into account in the executive evaluation procedure by the board of directors in professionally managed companies.

- The board of directors will follow the rule to make monetary rewards or compensation increases dependent on the performance of the entire company, and since executives are aware of this evaluation dimension, they get motivated to behave cooperatively. Additionally, the board of directors decides on job promotions based on the skills which an executive has displayed and which are relevant for the CEO position. One important skill in this respect is team leader qualities which encourages executives to contribute as much as possible to the success of the team. Thus, competitive attitude is retained, but in a sense to be conducive to team success, while detrimental disobliging behavior is discouraged.

By setting incentives to work together as a team, the team player model facilitates having top performers within a team in contrast to tournament pay settings in which the top performers might be sabotaged by their peers, or pay settings according to the equity model which does not provide financial incentives for top performers to join a team. As pointed out by Ang et al. (1998), the team player model is likely to occur in firms where the company success is dependent on collaborative behavior among the

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[70] Ang et al. (1998) base their model on previous research by authors such as McAfee and McMillan (1991), Nalbantian (1987), Gomez-Mejia and Balkin (1989), and Nalbantian and Shotter (1997).

top executives (as it is also mentioned above for the case of the pay equity model). The authors cite as examples the case when each executive possesses a different, specialized skill set as production, marketing or finance, or when *"the senior executives are not separately in charge of unrelated business groups of a diversified parent"* (341).

How does this model concretely affect compensation distribution within the executive board? According to Ang et al. (1998: 341), firms which implement the team player model show clear differences between the compensation packages of their executive board members. However, these pay differences would reflect differences in marginal products, while in a tournament model setting, the tournament prize would be incorporated so that the pay differences are larger than the differences in marginal products. Furthermore, when the team player model applies, there should be a clear link between team performance and compensation, but not between pay differences and firm performance. This is because pay differentials should largely reflect the differences in marginal products of executives.

2.2.4 Summary

As the above explications have shown, tournament and equity models comprise partly conflicting predictions that make only one of these strict theories applicable within one firm. Both theories, nonetheless, argue to be advantageous with regard to firm performance. Main et al. (1993: 607) note that the effects of pay distribution on performance depend largely on characteristics of the work at hand and the personal traits of employees involved. The advantages of a pay equity setting for organizational performance tend to be most significant in situations when work is highly interdependent and common effort is needed to achieve organizational goals (Bloom, 1999: 28) owing to the fact that compressed pay distributions encourage individuals to work together instead of competing against each other. In contrast, tournament theory-based pay settings prove superior if work can be executed relatively independently by individual employees if, for example, managers are in charge of different, independent business units.

Table 4 contrasts the assumptions and propositions of tournament theory and equity theory in a consolidated way. The team player model as an intermediary solution is not broached in this summary table. Due to its less categorical approach, however, it

may constitute the most practical theory of the three theories discussed. Yet, it also yields the least testable propositions.

	Tournament Theory	Equity Theory
Performance effect	Dispersed pay structures lead to better organizational performance.	Compressed pay structures lead to better organizational performance.
Performance determinant	Better organizational performance is grounded in higher levels of individual effort due to competitive nature of tournament setting.	Better organizational performance is grounded in enhanced teamwork and more harmonious social relations within the organization.
Managerial turnover	Higher managerial turnover as a result of lower employee commitment due to competitive climate.	Lower managerial turnover as a result of lower competition and higher employee loyalty.
Effect on cooperation	Less incentives to cooperate, higher risk of sabotage among tournament participants.	Feelings of fairness and common fate are conducive to cooperation.
Challenges	To prevent counteracting behavior.	To prevent executives from freeriding on others' efforts.

Table 4: Comparison of Tournament and Equity Pay Settings

The argument in this study is based on tournament theory when analyzing compensation gaps. Tournament theory is selected for two main reasons: Firstly, it is the most commonly used theory in the relevant literature. Secondly, even though equity pay models may seem desirable in the light of the current discussion in Switzerland to put limits on executive compensation packages, based on the large compensation gaps to be observed in practice (and which also caused the aforementioned discussion of compensation limits), the author assumes that these may rather be considered as a sign of tournament theory-based compensation designs

implemented in practice. Whether these supposed tournament theory-like compensation designs do in fact deliver the aspired outcome will be tested in the empirical section of this study.

As the empirical section also tests the connection between CEO and TMT member total compensation sums and firm performance, hypotheses in this regard are formulated based on agency theory (cf. Chapter 2.2).

Conclusion: The subsequent argument in this study is based on agency theory for total compensation sums and tournament theory for compensation gaps. If agency theory holds, CEO and TMT total compensation and firm performance are positively associated. Tournament theory proposes that larger CEO-TMT compensation gaps increase motivation and effort of the executives and, thereby, lead to better firm performance.

2.3 Exemplary Executive Compensation Concepts

Having covered the theories on pay distributions in detail, this chapter offers a practical perspective on compensation design: Firstly, it discusses fairness arguments which are to be kept in mind when setting compensation. Secondly, it presents best practice company examples which illustrate influencing factors of compensation sums at the executive board level in practice and provide first indications on what compensation disparity approach is chosen by companies praised for their compensation system. The importance of understanding the executive compensation determination process is rooted in the fact that it constitutes a prerequisite for being able to comprehend the resulting CEO-TMT compensation disparity of a company.

2.3.1 Fairness of Rewards and Variable Compensation Setting

Within the past decades, different theories such as social comparison processes theory (Festinger, 1954) or equity theory (Adams, 1965)[71] have underlined that individuals often judge the rewards they receive based on comparisons with rewards received by

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[71] Cf. Chapter 2.2.2.

other individuals. This builds the basis for a person's judgment of whether they are treated fairly, which, in turn, also impacts the individual's behavior (Wade, O'Reilly, & Pollock, 2006: 529).

Finkel (2000) notes that a fair reward distribution aims at equilibrating the interests of all people affected.[72] To achieve this, Hilb (2009) proposes the implementation of the "magic triangle of reward equity" (244) concept which differentiates between internal equity, external equity, and corporate equity. *Internal equity* refers to fairness of compensation with regard to aspects such as job content, competence, individual performance, and loyalty (Hilb, 2006: 130; Hilb, 2009: 244). *External equity* describes compensation equity with respect to the external labor market (Hilb, 2005: 575), i.e. what competitors pay for similar positions (Hilb, 2006: 131), whereas *corporate equity* sets individual compensation in relation to company performance (Hilb, 2006: 130; Hilb, 2009: 244). Figure 12 illustrates this concept.
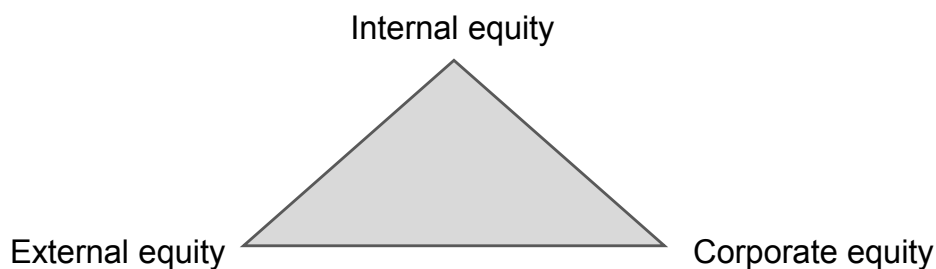
Figure 12: Reward Equity Triangle[73]

The idea of receiving higher compensation for better firm performance (i.e. corporate equity) alludes to the pay-for-performance notion. Linking compensation sums to firm performance is mainly achieved by means of variable compensation components.

Lately, the pay-for-performance link has been examined in different business magazines, for example by the German *Manager Magazin*, which ranked the 50 companies listed on the Euro Stoxx index (Palan, 2011, May 24). Here, especially CEOs of financial firms performed rather weak and were mainly found in the last

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[72] Hilb (2009) also refers to the principle of considering the interests of various parties by stating that within a compensation concept, *"the employee's contribution towards the creation and increase of shareholder, employee, customer and public value should be rewarded and encouraged"* (245).

[73] Source: Hilb (2009: 244).

third of the ranking due to the high compensation level in this sector. Moreover, the use of "golden parachutes" to compensate executives who were fired due to their bad performance generates the impression that executives may actually be rewarded for poor performance (Staljon Bührer, 2010: 26).

The design of compensation systems was often blamed as a reason for the financial crisis, as the design of incentive systems was considered to encourage excessive risk taking (Kirkpatrick, 2009: 13).[74] Consequently, the recommendations for adaptations as a result of the financial crisis mainly focused on variable compensation. In the following, some aspects of variable compensation design will be briefly discussed as these are also of interest for the subsequent quantitative analyses due to their influence on CEO compensation gaps and CEO compensation multiples. Overall, recent recommendations for the design of variable compensation components such as formulated by BCG (2009) or the FINMA circular ("Rundschreiben 10/1") on compensation systems tend to include similar issues like long-term focus, consideration of risk-aspects, and sustainability with respect to performance metrics used and value-creation.

In addition, Hilb (2006) recommends a "long-term orientation" (131–132) of at least three years with respect to variable compensation for board members and leading executives. Furthermore, he highlights that the allocation of variable compensation should not solely depend on financial metrics which measure the value created for shareholders (e.g. Economic Value Added [EVA]), but should also include non-financial performance metrics which reflect the interests of other stakeholders, such as clients, employees, or the public (131–132). The use of approximately 50% financial performance metrics and 50% non-financial performance metrics is recommended (Hilb, 2006: 131), while the individual allocation should take into account such factors as "the extent of responsibility, different variable proportions and long-term orientations" (132) which are selected for the corresponding position. However, currently only 13% Swiss firms and 14% European firms actually use non-financial

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[74] Chen, Steiner, and Whyte (2006) note in this regard that for the banking industry, the increasing use of stock options has led to a compensation structure that encourages risk-taking. Nevertheless, this statement is contradicted, for example, by Conyon et al. (2011) who state that bonus programs in bank do not lead to excessive risk-taking.

performance metrics in the process of determining variable pay (Institut für Führung und Personalmanagement [IFPM], 2010: 28).

2.3.2 Best Practice Company Examples

In the following, four Swiss firms which received awards based on a study of the "Institut für Führung und Personalmanagement (IFPM)" of the University of St. Gallen due to their excellent compensation practices, will be presented and analyzed with respect to compensation disparity aspects, since those are the focus of this dissertation.[75] These are Burckhardt Compression, Nestlé, Straumann, and Sika. Interestingly, the study of the "Institut für Führung und Personalmanagement (IFPM)" of the University of St. Gallen, which was conducted in 2010,[76] also showed that the five firms[77] with the most exemplary compensation systems at the same time belonged to the six most sustainably successful firms within the sample. This may be regarded as an indication of the economic value of well-developed compensation systems. The analysis is based on the information available in the compensation sections of the firms' annual reports of the year 2010, since the study of the IFPM was conducted in 2010 and also the data of the empirical part of this dissertation ends with the year 2010.

This discussion of company examples aims at providing insights into the practical implementation of good compensation strategies and covers factors which pertain to compensation disparity on executive board level. Each company example starts with a brief depiction of the firm characteristics, a) Company Profile, followed by a description of executive compensation setting characteristics, b) Management Compensation System.

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[75] For the study, a postal survey with six compensation categories (i.e. compensation policy, responsible persons for compensation, company-internal fairness of compensation, market-based fairness of compensation, performance-based fairness of compensation, and performance evaluation) and a total of 32 questions was sent out to 260 companies. The response rate was 16%. Subsequently, personal visits and interviews were conducted at the firms with the best ratings (Finanz und Wirtschaft, 2010, December 11: 20).

[76] A new study, conducted during the course of the dissertation, was published in 2012, and includes companies other than the ones that received a price in 2010.

[77] In the study cited above, the company Hilti was also positioned as one of the top five firms with regard to compensation practices. However, due to scarce compensation information available in its annual and financial reports, Hilti will not be included as a best practice case in this context.

Example 1: Burckhardt Compression

a) Company Profile

Burckhardt Compression is one of the leading manufacturing firms of reciprocating compressors, serving large multinational corporate clients (Burckhardt Compression, 2011: 2). At the end of 2010, Burckhardt Compression had 917 employees and achieved sales of CHF 356 million and an operating profit (EBIT) of CHF 62 million, which makes up 17% of sales (Burckhardt Compression, 2011). During the sample period of the quantitative analysis of this dissertation (2007 to 2010), Burckhardt Compression was neither listed in the SMI nor the SMIM, and therefore, is not included in the sample of the quantitative analyses.

b) Management Compensation System

Determination of Compensation Sums: Executives at Burckhardt Compression are compensated with a fixed base salary and a variable compensation component depending on performance and effort (Burckhardt Compression, 2011: 92). Variable and long-term compensation is calculated as a percentage of net profit after minorities and is converted into a certain number of Burckhardt shares on the basis of the year-end quote of the stock. Yet, strict allocation criteria are applied: A minimum financial performance with regard to return on sales has to be achieved in order that long-term incentives are paid out. If the minimum return on sales is achieved, but it is less than the benchmark, 50% of the long-term compensation is paid out. Only if the return on sales equals or exceeds the benchmark, executives are entitled to the full long-term compensation amount. The companies used for this benchmark consist of one direct competitor and two firms operating in the same sales market.

Top Management Team Compensation Disparity: When analyzing compensation disparity within Burckhardt's executive board based on the figures published in their annual financial report, a rather moderate compensation gap[78] of CHF 326,000 is calculated for the year 2010. This is the smallest absolute compensation gap calculated for all four companies presented in this chapter. But this is not surprising given that Burckhardt was also the smallest of these four companies and

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[78] CEO compensation gap is defined in Chapter 1.5.2.

compensation levels tend to increase in accordance with company size (cf. for example Chapter 3.2.3). When looking at the CEO compensation multiple,[79] which addresses the question – "How many times more does the CEO earn than the average TMT member?" – the ratio for Burckhardt is close to 2, which means the CEO earned about twice as much as the average TMT member in the year 2010. The individual figures are shown separately in Table 5.

Example 2: Nestlé

a) Company Profile

Nestlé is a large Swiss firm founded in 1866 with the business areas nutrition, health and wellness. Its brands are very well-known and include, for example Nescafé, Maggi, and San Pellegrino. Within its factories or operations in almost every country of the world, Nestlé has around 280,000 employees. In 2010, its sales reached nearly CHF 110 billion, with an EBIT above CHF 16 billion, which accounts for 15% of sales (Nestlé, 2011). Nestlé was SMI listed during the sample period of this study (2007–2010) and is consequently included in the company sample of Chapter 3.

b) Management Compensation System

Determination of Compensation Sums: In its management compensation system, Nestlé pays attention to considerations of internal equity (Nestlé, 2011: 24) and external equity (29), long-term orientation and symmetry of risk and reward. This reflects Hilb's recommendations regarding the dimensions of fairness of compensation (Hilb, 2009; cf. Chapter 2.3.1).

Nestlé's executive compensation is structured into a fixed annual salary and a variable, performance-based part, consisting of a short-term bonus which is awarded annually, and long-term incentive compensation. The variable proportion accounts for 50–80% of total direct compensation of executive board members.

The metrics used to determine variable compensation refer to the level, quality and sustainability of performance as well as to risk issues. The short-term bonus is set as a percentage of annual fixed salary and is paid out in total, if the objectives set at the

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[79] CEO compensation multiple is defined in Chapter 1.5.2.

beginning of the year are achieved. Otherwise, a lower bonus is paid out. Those objectives include "collective" objectives which are weighted with 30%, as well as "individual" objectives (Nestlé, 2011: 29), weighted at 70%. On one hand, collective objectives refer to group-level operational objectives which are measurable; on the other hand, they also include non-financial objectives.

The explicit use of non-financial objectives constitutes a positive differentiating factor and reflects Hilb's recommendation of using both financial and non-financial performance objectives (Hilb, 2006; cf. Chapter 2.3.1). Additionally, the CEO sets individual objectives for each TMT member. Only the CEO is evaluated solely based on group level metrics, which is in accordance with recommendations by Ethos (2013: 69).[80] Furthermore, Ethos (2013: 68) recommends the use of limits to variable compensation. Nestlé implements variable compensation limits by setting the maximum bonus sum to 130% of the target (Nestle, 2011: 30). Thus, excessive bonus payments will be prevented.

Top Management Team Compensation Disparity: Of the four firms in this chapter, Nestlé displays the highest compensation disparity, both in absolute and in relative terms. Nestlé's compensation gap is close to CHF 8,200,000 and also its CEO compensation multiple of 3.4 is the highest of the "best practice" firms presented in this chapter.[81] Nevertheless, Nestlé also constitutes the largest of these firms. Table 5 summarizes the figures for Nestlé.

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[80] Cf. Chapter 4.2.4.

[81] Yet, for Nestlé, there are some minor discrepancies of the figures published in the annual report and the figures listed in the Ethos study. For the calculation above, the figures of the annual report were used, excluding pension fund contributions from the total compensation sums. However, when performing the calculations based on the figures of the Ethos study 2010, the results change slightly: The compensation gap increases to CHF 8,965,000, while the CEO compensation multiple reaches 3.6.

Example 3: Straumann

a) Company Profile

Straumann is a globally leading manufacturer of dental implants, dental prosthetics, and related instruments, as well as products for tissue regeneration. Its products can be purchased in more than 70 countries. In 2010, Straumann realized net revenues of CHF 737 million, with an EBIT of CHF 164 million and a margin of EBIT/net revenues of 22%. At the end of 2010, Straumann had 2,361 employees (Straumann, 2011). During the sample period 2007–2010, Straumann was a SMIM company and, thus, is included in the empirical sample of the quantitative analyses of this dissertation.

b) Management Compensation System

Determination of Compensation Sums: Straumann's management compensation system aims at rewarding long-term value creation in order to foster "sustainable performance, loyalty and entrepreneurship" (Straumann, 2011: 115). This is remarked to be advantageous to both shareholders and stakeholders. Including the stakeholder perspective with respect to compensation setting is still relatively rare to be explicitly mentioned in annual reports, and is consistent with the recommendations by Hilb (2009; cf. Chapter 2.3.1).

Straumann pays its management a total compensation sum including fixed and variable components, the proportion of each being based on "role, profile and location" (116). For the Executive Management Board, including the CEO, around 40% of total compensation is fixed, while 60% is variable. Thus, as noted by Straumann (2011: 120), a higher downside-risk, but also upside-potential is ensured.[82]

By using benchmarks consisting of over 20 comparable companies, Straumann strives to keep its compensation levels in line with market practices (116). This market-orientation reflects the dimension of "external equity" elaborated by Hilb (2009, cf. Chapter 2.3.1). For determining variable compensation, also the aspect of internal

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[82] The downside-risk has become striking in the case of stock options which are reported to have displayed a negative value development throughout the preceding 6 years, and have, therefore, had a negative effect on management compensation sums (Straumann, 2011: 120).

equity (including individual performance) is highlighted as an influencing factor, besides firm performance and legal constraints.

Top Management Team Compensation Disparity: With almost CHF 441,000, Straumann displays the second smallest compensation gap of the four companies in absolute terms, while relative compensation disparity within the executive board, measured here by means of the CEO compensation multiple, is the smallest. The multiplier of 1.4 is by far the smallest of the four companies, indicating that the average TMT member earned more than 70% of the CEO's total compensation in 2010. Table 5 summarizes the figures[83] and results for Straumann.[84]

Example 4: Sika

a) Company Profile

Sika is a Swiss international firm in the specialty chemicals sector. In 2010, Sika achieved net sales of CHF 4.4 billion and an EBIT of CHF 440 million, which represents 10% of net sales. Sika counted 13,482 employees by year-end 2010 (Sika, 2011) and was part of the SMIM within the sample period 2007 to 2010. It is, therefore, included in the sample of the empirical part of this study.

b) Management Compensation System

Determination of Compensation Sums: Sika highlights the importance of the two dimensions of external and internal equity in its compensation report: Sika strives to design its compensation system in a way to ensure competitiveness on the external labor market, "while establishing, internally, as equitable a salary structure as possible" (Sika, 2011: 41). This again refers to the compensation fairness principles by Hilb (2009, cf. Chapter 2.3.1).

Executives at Sika receive a total compensation package with a fixed and a variable salary proportion. Sika's financial targets are weighted with 70%, while quantitative

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[83] Due to changes in Straumann's Executive Management Board during the year 2010, a full-time equivalent was calculated based on the number of months in which the top managers were in office. This resulted in a TMT (excl. CEO) of 2.75 persons, representing two persons officiating during the whole year and one new TMT member who came into his position on April 1, 2010 (thus, serving for ¾ of a year).

[84] As Straumann is also part of the Ethos 2010 compensation study, which is used as a data source for the empirical part of the dissertation, a comparison of figures was made which showed very similar results.

and/or qualitative targets on an individual level carry a weight of 30%. Thus, qualitative targets are incorporated in the performance objectives as recommended by Hilb (2006: 131), even though not to such a substantial degree as Hilb proposes. Furthermore, limits are set for variable compensation (Sika, 2011: 5) to prevent excessive compensation sums.

Top Management Team Compensation Disparity: Sika's compensation gap of CHF 1,371,000 was significantly larger than that of Burckhardt and Straumann, while its CEO compensation multiple of 2 was close to that of Burckhardt.[85] The figures are summarized in Table 5.

Comparative Analysis of Company Examples

The best practice company examples yield several insights into compensation setting in practice: Firstly, the examples highlight that variable compensation components make up a large part of total compensation, as explicitly mentioned for Nestlé and Straumann. Secondly, this variable compensation proportion depends on target achievement and, thus, cannot be calculated in advance. Thirdly, Nestlé and Sika mention that they set both financial and non-financial targets for the determination of variable compensation attribution as recommended by Hilb (2006, cf. Chapter 2.3.1). In connection with the type of targets set, however, Ethos (2013: 69) points out that CEO compensation should depend solely on firm performance. This recommendation is implemented by Nestlé. Additionally, Nestlé points out that they installed a bonus limit of 130% of the target bonus sum. Hence, bonus excesses will be prevented. Finally, Nestlé, Straumann and Sika mention that they strive to reflect internal and external equity considerations in their compensation designs: Straumann notes that they rely on benchmarks for setting compensation levels in line with market practices. Apart from illustrating the use of benchmarks, this also hints at the aspect of market orientation (i.e. external equity), as a guideline for setting compensation levels. This is also explicitly mentioned for Nestlé as a compensation setting principle. Furthermore, Nestlé and Straumann refer to internal equity considerations, highlighting company-internal fairness of compensation setting (cf. also Hilb, 2009: 244 and Chapter 2.3.1).

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[85] Sika is also listed in the Ethos 2010 compensation study, which is used as the data source for the compensation figures of the empirical part of the dissertation. For this case, too, the comparison of figures used for the calculation above and those adapted by Ethos in their study, showed very similar results.

According to the analysis conducted by the "Institut für Führung und Personalmanagement" of the University of St. Gallen, Hilb pointed out a shared-value approach, creating simultaneously benefits for customers, shareholders, employees as well as society and environment, as a common feature of these best practice firms, while these companies were not focused solely on maximizing shareholder value on a quarterly basis (Finanz und Wirtschaft, 2010, December 11: 20).

Finally, insights are derived with regard to executive compensation disparity. Table 5 provides the individual figures and compensation disparity measures calculated for the four companies.

Company Comparisons				
in CHF	**Burckhardt Compression**	**Nestlé**	**Straumann**	**Sika**
Firm Size				
# Employees	917	280'000	2'361	13'482
EBIT (in CHFm)	62	16'000	164	440
CEO Compensation	628'000	11'603'997	1'558'000	2'729'000
Total TMT Compensation	3'321'000	52'499'226	3'073'000	17'654'000
# of TMT (excl. CEO)	11	12	2.75	13
Avg. TMT Compensation	301'909	3'407'936	1'117'455	1'357'931
Compensation Disparity Measures				
CEO Compensation GAP	326'091	8'196'061	440'545	1'371'069
CEO Compensation Multiple	2.1	3.4	1.4	2.0
Part of Sample in Empirical Part	No	Yes	Yes	Yes

Table 5: Comparison of Best Practice Firms

What do the figures show with respect to compensation disparities? Firstly, the higher the absolute compensation figures for both TMT members and the CEO, the higher was the calculated absolute pay disparity figure, measured as CEO compensation gap. This finding is not very surprising. Yet, the relative metric, the CEO compensation multiple, did not show such a link as the absolute compensation figures which are strongly linked to firm size had no influence on the calculations. Nestlé, however, still showed the largest CEO compensation multiple with a multiple of 3.4, while Straumann displayed the smallest CEO compensation multiple with a value of 1.4. For comparison, values for the median and average CEO compensation multiple of SMI and SMIM firms are calculated based on the sample of the empirical part of this study. The average CEO compensation multiple for the basic sample of 168 firm-year observations amounts to 2.7, while the calculation of the median yields 2.3 (cf. App. 15). Therefore, the CEO compensation multiples of Burckhardt, Straumann and Sika are below the median, reflecting more compressed compensation distributions, while Nestlé with a CEO compensation multiple that is clearly larger than the median and mean seems to follow a more hierarchical compensation approach.

Conclusion: Compensation should be fair both on internal and external levels, as well as with regard to firm performance. Total compensation sums (and consequently executive compensation disparity) cannot be predicted or planned exactly in advance, as they depend on the allocation of variable compensation components which account for a significant proportion of total compensation. Variable compensation should be determined based on both financial and non-financial targets and bonus limits may be used to prevent salary excesses. CEO performance should solely be evaluated on the basis of group performance. Firms with exemplary compensation practices were at the same time the most sustainably successful companies.

2.4 Literature Review

This chapter will provide an overview of the relevant publications relating to compensation differences within the executive board, aiming at recapitulating the current state of research within this field. At the same time, these publications build the foundation for elaborating the moderating variables and hypotheses in Chapter 2.5.1.

The number of TMT compensation publications augmented notably within the last few years which certainly partly reflects the increased attention paid to topics of executive compensation also in the public sphere, as well as the associated call for a deeper understanding of how management compensation and corporate performance are interconnected.

Nevertheless, many of the publications which examine the link between compensation differences and resulting effects on performance were not conducted in the business field, but in sports or academia. Bloom (1999), for example, studied baseball players and teams and found that less dispersed pay distributions within a team were positively associated with various measures of individual and team performance. However, pay inequality was positively linked with individual performance of high earning players, but negatively associated with the performance of players with lower pay. In other sports-based studies, higher winning prize differentials were positively related with individual performance, as, for example, shown by Becker and Huselid (1992) who studied auto racers, and Ehrenberg and Bognanno (1990) who examined the performance of European professional golf tour players. Another seminal study on pay disparity and performance was conducted by Pfeffer and Langton (1993) in the field of academia. In this study, higher pay dispersion was associated with lower satisfaction, lower collaboration in research as well as lower productivity of academic researchers. This study also hints at the impact of knowledge of other colleagues' compensation sums: In private universities where salaries were not as openly visible as in public universities, compensation dispersion had a less adverse impact on satisfaction.

These studies show that research results with respect to the link between pay distribution and performance are not very straightforward, but seem to depend on surrounding conditions. Additionally, these studies were not conducted in a business

setting, but the chosen context might also influence the results. Thus, the following subchapter will outline the research outcomes within the specific field of interest of this dissertation, which is the link between CEO-TMT compensation distributions and firm performance. The subsequent subchapter will then discuss past research results on factors which moderate this relationship. Thus, the next two subchapters provide first insights into research questions 1 to 3 (cf. Chapter 1.3).[86]

2.4.1 CEO-TMT Pay Distribution and Firm Performance

This literature review focuses on relevant publications which provide evidence on the kind of relationship between CEO-TMT pay distributions and firm performance. Table 6 sums up the main aspects of the discussed publications in tabular form.

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[86] Research question 1 concerns the measurement of compensation differences within the executive board, research question 2 refers to the link between CEO compensation gap (as well as CEO compensation and TMT compensation) and firm performance, while research question 3 relates to the influence of moderating variables on the strength of the relationship between CEO compensation gap and firm performance.

Author(s)	Country (Time); Sample	Performance Measure; Pay Measure	Main Findings Regarding Pay Disparity and Firm Performance
Main, O'Reilly, and Wade (1993)	•US (1980–1984) •210 firms, 769 firm-year observations	•ROA and shareholder return •Coefficient of variation	• Significant positive association between pay dispersion and ROA • No statistical significance for association of pay dispersion with stock market return • Team interdependence not a significant moderator
Ang, Hauser, and Lauterbach (1998)	•Israel (1994) •367 firms listed on the Tel Aviv Stock Exchange	•Net income[87] •CEO pay gap[88] and "Adapted" CPS[89]	• Pay contract structure encourages senior executives to cooperate (team player model) • No significant relationship between pay disparities and firm performance • Positive link of pay differentials and firm performance solely in owner-managed firms
Eriksson (1999)	•Denmark (1992–1995) •210 firms, 2600 executives	•3-year average ratio of profits over sales (=profits/sales) •CEO pay gap[90] and coefficient of variation	• Positive association between pay gap and firm performance (significant for CEO pay gap, almost significant for coefficient of variation) • No evidence for different association if a firm's executive board is more interdependent

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[87] Corresponds to "after tax income."

[88] CEO pay gap is calculated by subtracting average pay of the four highest ranked non-CEO TMT members from that of the CEO.

[89] Ang, Hauser, and Lauterbach (1998) use a "pay level ratio" (PLR) which is calculated as CEO pay divided by the average pay of the next four highest ranking TMT.

[90] CEO pay gap is calculated here by subtracting the average pay of all VPs (defined as being "reported by the firm to have significant responsibilities," meaning having jobs "at the policy level" (Eriksson, 1999: 274).

Author(s)	Country (Time); Sample	Performance Measure; Pay Measure	Main Findings Regarding Pay Disparity and Firm Performance
Conyon, Peck, and Sadler (2001)	• UK (1997–1998[91]) • 100 stock market firms, 1115 directors	• Annual total shareholder return (TSR)[92] and ROA • Coefficient of variation	• No robust relationship between pay dispersion within the executive board and firm performance
Henderson and Fredrickson (2001)	• US (1985, 1990) • 189 firm-years; chemical, high-tech equipment, natural resources firms and conglomerates	• ROA and ROE[93] • CEO pay gap[94]	• Positive link between pay gaps and firm performance in firms with higher levels of diversification in related business areas and a higher number of vice presidents (VPs) • Negative link between pay gaps and firm performance in firms with a higher number of businesses and higher capital investment activity
Carpenter and Sanders (2004)	• US (1992, 1993–1995[95]) • 224 multinational firms	• Subsequent MTB,[96] subsequent ROA[97] • CEO pay gap	• CEO total pay gap is negatively linked with subsequent firm performance, especially for firms with a high degree of internationalization

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[91] The authors note that the tests are conducted for the fiscal year 1997–1998 (Conyon, Peck, & Sadler, 2001: 810).

[92] Calculated as "annual share price appreciation plus dividends on a continuously reinvested basis" (Conyon et al., 2001: 809).

[93] Not used as main measure, but tests yielded similar results.

[94] In US studies, CEO pay gap is often measured by the delta between CEO pay and average pay of the following four highest paid TMT. This definition also applies to Carpenter and Sanders (2004).

[95] The latter time frame corresponds to the period in which the lagged performance data was collected, while compensation data was retrieved for 1992.

[96] Market-to-book ratio is calculated as market value divided by book value with a 1-year time-lagged performance measure relative to independent variables. Comparable results were obtained when the average market-to-book ratio for 1993 to 1995 was used.

Author(s)	Country (Time); Sample	Performance Measure; Pay Measure	Main Findings Regarding Pay Disparity and Firm Performance
Siegel and Hambrick (2005)	• US (1991–1992) • 67 firms	• Industry-adjusted subsequent average relative MTB[98] and TSR[99] • Other[100]	• Strong negative link between top executive pay disparity and firm performance in high-technology firms[101] • No such link in low technology firms
Jonas (2007)	• US (1995–2004) • 13,021 firm-year observations	• Subsequent TSR,[102] Subsequent ROA[103] • "Adapted" pay gap	• Weak support for negative and transitory effect of TMT pay disparity on firm performance[104]

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[97] Yielded same hypothesis support, although not directly reported in the study.

[98] MTB ratio was calculated as the company's common equity market value divided by the common stock book value. The subsequent average relative ratio was defined by the average ratio for the two years following the year of the compensation data, compared to the firm's peers' ratio by deducting the two-year average industry mean.

[99] Total shareholder return (TSR) was computed as the two-year average of the years following the year of compensation data by adding share appreciation and reinvested dividends. The mean of the two-year average TSR ratio of the firm's industry peers was then subtracted.

[100] Siegel and Hambrick (2005) used the following measures for vertical pay disparity: a) Total pay CEO divided by Ø total pay of level 2 executives; b) Ø total pay level 2 executives divided by Ø total pay level 3 executives; c) Tournament pay = (Total pay CEO / Ø total pay level 2 executives) / (Ø total pay of level 2 executives / Ø total pay of level 3 executives). Additional measures were used for horizontal and overall pay disparity.

[101] No such link was found in the case of the measure "Total pay CEO / Ø total pay level 2 executives."

[102] Subsequent TSR was calculated as annual stock appreciation plus dividends.

[103] Subsequent ROA was calculated for the following 1, 3, and 5 years.

[104] However, it has to be noted that this study uses a measure for TMT pay disparity which excludes CEO pay and focuses on non-CEO TMT pay disparity. Thus, it is not directly comparable to the other studies cited here.

Author(s)	Country (Time); Sample	Performance Measure; Pay Measure	Main Findings Regarding Pay Disparity and Firm Performance
Lee, Lev, and Yeo (2008)	•US (1992–2003) •1,855 listed firms, 12,197 firm-year observations, financial firms and utilities excluded	•Tobin's Q,[105] Subsequent ROA,[106] abnormal stock performance •Coefficient of variation	• Tobin's Q is positively linked with compensation dispersion in the executive board • Link is stronger for firms with high agency costs related to managerial discretion • Link is stronger for firms with effective corporate governance, particularly with high board independence • Compensation dispersion is positively associated with subsequent ROA and abnormal stock return
Bebchuk, Cremers, and Peyer (2009)	•US (1993–2004) •2,015 firms, 12,011 firm-year observations, 3,256 CEOs	•Subsequent industry-adjusted Tobin's Q,[107] subsequent industry-adjusted ROA[108] •CPS	• Higher CPS is linked with lower Tobin's Q and lower accounting profitability • Particularly strong negative correlation between CPS and Tobin's Q for firms with higher entrenchment levels

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[105] Calculated according to the formula: Tobin's Q = (Market value of common equity + Book value of liabilities) / End-of-year book value of total assets of the firm.

[106] Subsequent ROA calculated over the three years following the year of compensation data.

[107] Calculation formula: Industry-adjusted Tobin's Q = (Market value of equity + Book value of assets - Sum of book value of common equity and deferred taxes) / Book value of assets) - industry mean Tobin's Q.

[108] Calculated as following: Industry-adjusted ROA = (Operating income / Book value of assets) - Median ROA of firms in same SIC industry and year.

Author(s)	Country (Time); Sample	Performance Measure; Pay Measure	Main Findings Regarding Pay Disparity and Firm Performance
Kale, Reis, and Venkates-waran (2009)	• US (1993–2004) • 2,367 firms, 17.987 firm-years, 4,202 CEOs, 25,461 VPs	• ROA,[109] Tobin's Q,[110] OIBD to Capital,[111] ROE[112] • "Adapted" CEO pay gap[113]	• Positive association of "adapted" CEO pay gap with firm performance (Tobin's Q and ROA)[114] • Association is more positive when CEO nears retirement, and less positive when the firm has a new CEO, especially if the new CEO is from outside the company

Table 6: Literature Review in Chronological Order

As can be seen in the tabular summary, 8 out of 11 studies are based on US samples which underlines the US-centric bias in extant research. With respect to the question on the relationship between CEO-TMT pay differentials and corporate performance, the findings are mixed and there is evidence found both for tournament theory and equity theory.

Several studies on the topic provide evidence in favor of tournament theory: Main et al. (1993) show a positive link between CEO-TMT compensation dispersion as measured by the coefficient of variation and return on assets (ROA) for a US sample, and Eriksson (1999) shows a significant positive link between compensation disparity

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[109] Calculated as a firm's net income divided by total assets (= net income / total assets).

[110] Calculated as the market value of equity plus the book value of debt, divided by total assets (= (market value of equity + book value of debt) / total assets).

[111] Calculated as the firm's operating income before depreciation (OIBD) divided by net fixed assets (= firm's operating income before depreciation / net fixed assets).

[112] Calculated as net income divided by book value of equity (= net income / book value of equity).

[113] CEO compensation gap is calculated using the median value of total VP compensation, instead of the average value which is employed in most other studies.

[114] Also positive link for supplementary analyses with OIBD to Capital and ROE as performance measures, even though only statistically significant for OIBD to capital measure (Kale, Reis, & Venkateswaran, 2009: 1504).

as measured by the CEO compensation gap and firm performance, and an almost significant link when measuring compensation dispersion via the coefficient of variation for a Danish sample. Also one of the fairly recent studies report a positive association between CEO-TMT compensation dispersion and firm performance: Lee et al. (2008) show for their US sample that compensation dispersion was positively linked to several measures of firm performance. The study by Kale et al. (2009) also affirms the positive relationship between various measures of firm performance and CEO-TMT compensation disparity.

However, some studies also find a negative relationship between CEO-TMT compensation differentials and firm performance. Carpenter and Sanders (2004) show a negative link between CEO compensation gap and firm performance. Siegel and Hambrick (2005) detect a negative relationship between pay differentials and company performance for high-technology companies, while they did not find such a link in low-technology firms. Interestingly, these results apply to all compensation disparity measures used, except for the compensation difference between CEO and level 2 executives. The results of the latter were not significant. Jonas (2007) finds only weak support for a transitory negative effect of TMT pay differentials on firm performance, based on a TMT pay disparity measure excluding CEO compensation. Finally, Bebchuk et al. (2009) add further evidence in favor of a more compressed compensation structure by showing that higher CPS is associated with, among other things, lower Tobin's Q and lower accounting profitability.

However, some studies do not find convincing evidence for either a positive or negative relationship between CEO-TMT pay differentials and corporate performance. For example, Ang et al. (1998) argue for a third model besides tournament theory and equity theory and propose a team player model. Only for owner-managed firms, the authors note that higher compensation disparity within the executive board is linked with better firm performance. Conyon et al. (2001) do not find a robust relationship between measures of pay dispersion on the executive board level and firm performance, while Henderson and Fredrickson (2001) opt for a situational differentiation: They observe that for firms with a higher degree of related diversification and a higher number of vice presidents, the link is positive, whereas for firms with more businesses and more capital investment activities, the association between pay gaps and firm performance is negative.

This illustrates that also in the extant literature on this small section of executive compensation research, results are inconsistent. About half of the major research contributions support a positive relationship between compensation differentials and firm performance, while the other half provides evidence for the contrary, and a few publications are undetermined. These mixed results may partly be related to the different samples used and to the different measures of CEO-TMT compensation differentials and corporate performance employed. However, they also speak in favor of situational differentiation and the examination of potential moderators.[115] Therefore, such potential moderators are discussed in the next chapter.

> **Conclusion:** The literature review illustrates the US focus of research in the field of executive board compensation. Extant results do not provide conclusive evidence regarding the direction of the association of CEO-TMT compensation disparity with firm performance, thereby indicating that supplementary analyses of moderating effects might be valuable.

2.4.2 Moderating Factors

As Bloom (1999: 36) notes, the context and specifically the degree of cooperation needs and interdependence of work processes may also impact the effect of certain pay distributions on performance. Less compressed pay distributions may be more advantageous when individual contributions are of major importance, for example in law, accounting, or consulting companies, and when individual contributions can be judged separately from firm performance, as in the case of stock brokers or academic researchers. Under such circumstances of lower importance of cooperation, a larger pay disparity focusing on individual incentives may be beneficial for both individual and organizational performance. On the other hand, Bloom (1999: 36) notes that this line of argument seems less appropriate for organizational types such as fire-fighting squads, manufacturing teams or hotel service staff where performance as a team is more important.

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[115] Examining moderator effects is a frequently used method when observed relationships are weak (Baron & Kenny, 1986).

The literature review in the previous chapter demonstrates that many studies added certain moderating factors to the analysis, which are expected to influence the examined relationship between CEO-TMT compensation differentials and firm performance, as already mentioned above with respect to the situational differentiation by Henderson and Fredrickson (2001). Thus, it is examined whether the supposed relationship is peculiar to situations in which a specific moderating factor is present. For the studies presented in the previous chapter, these moderating factors and their respective influence on the relationship of CEO-TMT pay distribution and firm performance are summed up in Table 7. The moderating variables are structured in three groups: CEO characteristics, corporate governance characteristics, and firm and industry characteristics.

Moderator	Theoretical influence[116]	Empirical influence[117]	Study
CEO Characteristics			
CEO nears retirement	+	+	Kale et al. (2009)
New CEO	-	-	Kale et al. (2009)
CEO from outside	-	✖	Bebchuk et al. (2009)
New CEO from outside	--	--	Kale et al. (2009)
CEO = Chairman of BoD	-	-[118]	Kale et al. (2009), Lee et al. (2008)
Succession plan in place	-	✖	Kale et al. (2009)
Corporate Governance Characteristics			
Owner = manager	+/0/-	+	Ang et al. (1998)
Entrenchment level	-	-	Bebchuk et al. (2009)
Compensation level of 5 highest-paid executives	+/-	-	Bebchuk et al. (2009)
Compensation level of 4 highest-paid TMT members (excl. CEO)	+	✖[119]	Bebchuk et al. (2009)

[116] The indications in this column refer to the expected direction of influence of a certain moderator on the relationship of executive compensation differentials and firm performance according to the hypotheses stipulated by the authors of the respective study. The plus signs (+) indicate that the presence of the moderator is expected to strengthen the considered relationship while a minus sign (-) stands for an expected weakening of the relationship if this moderator is present.

[117] This column presents the empirical results of the studies. Plus (+) and minus (-) signs are to be interpreted like those in the column relating to the theoretical influence. If no evidence could be found to support the hypothesis (i.e. coefficients for specific variable were not significant), a cross is inserted in this column. The double minus for "new CEO = outsider" means that the effect is even stronger than the sole effect of a new CEO (which already constitutes a moderating factor of itself).

[118] Both studies found support for this hypothesis. Lee, Lev, and Yeo (2005) referred to this variable as "CEO Duality."

[119] Bebchuk, Cremers, and Peyer (2009) found that for both company groups, one with a TMT compensation higher than the average of their peer companies and one with a TMT compensation lower than the average of their peers, the interaction terms were significant and negative. Thus, the pay level of the four highest ranking, non-CEO executives (which is considered to reflect their managerial qualities) cannot be shown as a factor determining the strength of the relationship under consideration.

Moderator	Theoretical influence[116]	Empirical influence[117]	Study
Number of VPs	+	+	Henderson & Fredrickson (2001)
Agency costs related to managerial discretion	+	+	Lee et al. (2008)
Inside equity	+	✘	Lee et al. (2008)
Institutional equity	+	✘	Lee et al. (2008)
Fraction of outside directors	+	+	Lee et al. (2008)
Firm & Industry Characteristics			
Level of related diversification	+	+	
Number of businesses	+/-	-	
Capital investment activity	+/-	-	Henderson & Fredrickson (2001)
Firm size	+/-	✘	
R&D Activity[120]	+/-	✘	
Degree of internationalization	-	-	Carpenter & Sanders (2004)
High-technology firms	-	-	Siegel & Hambrick (2005)
Homogeneous industry	-	-	Kale et al. (2009)
Proportion of profit center heads[121]	+	✘[122]	Main et al. (1993), Eriksson (1999)

Table 7: Moderators and Their Influence on Firm Performance

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[120] R&D intensity was also used as a measure for the moderator "agency costs" in the study by Lee et al. (2008) who found a positive association with firm performance.

[121] A lower proportion of profit center heads is considered as an indicator for higher team interdependence.

[122] Same result in both studies.

Kale et al. (2009) examine the impact of the following moderators of the relationship between CEO-TMT pay gaps and firm performance: 1) the firm has a new CEO, 2) the new CEO is an outsider, 3) the current CEO is close to retirement, 4) the CEO is also chairman of the board, 5) the firm has a succession plan in store, 6) the industry of the firm is homogeneous.[123] The authors argue that such factors have an influence on the probability of being promoted from VP to CEO, and thus, impact the work motivation of non-CEO TMT members. As a result *"for a given pay gap an increase (decrease) in the probability of promotion will strengthen (weaken) the relation between the pay gap and firm performance"* (1498). With respect to the chosen moderators, this leads to the following hypotheses and associated results of the analysis by Kale et al. (2009):

1) When a *new CEO* is in office, the probability of being promoted to CEO is lower for the officiating VPs. As a result, tournament effects are expected to be lower which translates into lower firm performance. The empirical analysis provides some support for this hypothesis.

2) If the *new CEO* was hired from *outside* the company, the incumbent VPs rate the probability of being promoted even lower than if the new CEO was an insider, which in turn also lowers tournament incentives and leads to a lower expected firm performance. The hypothesis was supported in the empirical analysis.

3) If a firm's *CEO nears retirement age*, the probability of an early promotion increases for VPs, which strengthens tournament incentives and should lead to better firm performance. The empirical analysis supports this hypothesis.

4) When the *CEO* is not at the *same time chairman of the board of directors*, this can be interpreted as a sign for a weaker standing of the CEO within the company. Therefore, the chances of being promoted are better, tournament effects are higher and as a result, firm performance should also be higher.[124] There is some empirical evidence which supports this hypothesis.

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[123] The variable industry homogeneity measures the "similarity between firms within an industry after isolating market effects" (Kale, Reis, & Venkateswaran, 2009: 1489) and is calculated based on monthly return data.

[124] However, this argument does not hold true for all national contexts. The unity of CEO and chairman of the board is especially pronounced in US companies, whereas this is much less common in Switzerland.

5) If a *succession plan* designates a certain person as successor of the current CEO, this lowers the probability of being promoted for the other VPs and should consequently lower tournament incentives as well as firm performance. This hypothesis is barely supported by the results of the analysis.

6) The more *homogeneous an industry* is, the higher are the chances that a new CEO is hired from outside the company and the better are the employment opportunities for VPs at other firms. This lowers the probability of a promotion from within the firm and leads to lower tournament incentives. Therefore, a lower firm performance is expected. The hypothesis tends to be supported by the empirical evidence.

In the majority of cases within the study by Kale et al. (2009), the most significant results were achieved using Tobin's Q as firm performance measure. However, ROA led to many significant results as well.

Bebchuk et al. (2009: 9) examine entrenchment level[125] as a moderator of the relationship between compensation differences within the executive board and firm performance. They use an entrenchment index between 0 and 6, where higher scores reflect a lower level of shareholder rights and a higher level of management entrenchment. The authors argue that in firms with more management entrenchment, *"the CEO and the board are relatively insulated from market discipline and the threat of removal"* (22). Thus, there exists a higher potential that agency problems occur and that the optimal CPS level[126] is not maintained. The hypothesis to be deduced is that higher entrenchment levels negatively affect the relationship between CPS and firm value.

This is confirmed by the data which shows that *"the negative correlation between CPS and firm value is more pronounced in firms with higher entrenchment levels"* (22).

Additional moderators examined by Bebchuk et al. (2009) are the level of top 5 compensation, the level of TMT compensation (excl. CEO), as well as the influence of having a CEO who was hired from inside or outside the company. The rationale of

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[125] Management entrenchment describes the situation that a manager is in such a position that it is difficult for the shareholders to replace him or her (Shleifer & Vishny, 1989: 123).

[126] Compare Chapter 1.5.2 for a definition of CPS.

the examination of the pay levels is to find out whether the detected negative association between CEO-TMT compensation disparity and firm performance is particular to firms with a better or lower quality TMT. The authors argue that a *top five TMT compensation level* (incl. CEO) above the average of the peer group may reflect a difficult environment and in connection with this the need to attract and retain important talent. However, the authors did not explicitly specify a hypothesis in this regard. When considering the pay level as an indication of the quality of managers hired, a higher compensation level should reflect better management capabilities, and should, therefore, tend to increase firm performance. A *non-CEO TMT compensation level* below the average may hint at a lower-quality bench and simultaneously at a high-quality CEO who had been appointed to make up for the lower quality TMT (Bebchuk et al., 2009: 23). This would result in an increased CPS, and would be expected to lead to a lower performance. On the other hand, companies with a higher quality TMT would display a smaller CPS and should have a better performance. The reasoning regarding *outside and inside CEOs* is that firms which do not perform well may have to hire an outside CEO who then receives higher compensation.

The empirical evidence shows that the link between lagged CPS and industry-adjusted Tobin's Q is especially negative for firms where the top 5 TMT group (incl. CEO) earns more than the average.[127] No evidence is found that the link between lagged CPS and Tobin's Q is especially negative for companies with a lower quality TMT. Finally, the hypothesis that having an outside CEO in place has a negative moderating effect of the relationship of CPS and firm performance is not backed by the data either.

Lee et al. (2008) focus their analysis of moderating factors of the relationship between TMT pay distribution and firm performance on corporate governance factors. They hypothesize that the link is stronger in firms with high *agency costs* (cf. Chapter 2.2) due to managerial discretion. In such companies, a high pay differential may be installed to reduce unwanted behavior since "*the prospects of the "big prize" (CEO compensation) lie in the future, when the outcome of R&D projects or other*

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[127] However, no significant effect could be found for firms where the top five compensation levels are below the average.

investments will materialize, thereby providing ex ante disincentives to inflate investment prospects" (Lee et al., 2008: 11). Secondly, the authors test whether pay dispersion within the executive board is more strongly linked with firm performance if the firm possesses *effective corporate governance structures*. The reasons given for this hypothesis are that potential undesirable effects in a tournament setting, e.g. sabotage of co-workers (cf. Chapter 2.2 for more details), may be mitigated through a closer oversight by independent board members and institutional investors.

The empirical analysis shows a stronger link between firm performance and compensation dispersion for companies with higher agency costs as measured by the intensity of R&D and advertising. With regard to the link of CEO-TMT compensation disparity and firm performance in the presence of effective corporate governance structures, a high fraction of outside directors on the board is related to a stronger link, while CEO duality leads to a weaker association. The additional corporate governance variables tested, which are inside equity[128] and institutional equity[129], do not display a significant association.

Siegel and Hambrick (2005) studied several forms of CEO-TMT compensation disparity, such as vertical pay disparity (pay disparity between organizational levels), horizontal pay disparity (pay disparity across the same organizational level), and overall pay disparity (a collective measure incl. vertical and horizontal pay disparity). With respect to vertical executive compensation disparity, which is of interest in this dissertation, the hypothesis was that the higher the *technological intensiveness of the industry* in which the firm is located, the greater are the collaboration needs and the more negative is the link between vertical pay disparity and successive firm performance. This hypothesis was confirmed based on the data.

Carpenter and Sanders (2004) study CEO and TMT pay in multinational companies and test if the link between CEO-TMT pay gap and firm performance is moderated by

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[128] The variable inside equity is measured as the proportion of common equity held by officers or directors (Lee et al., 2008).

[129] The variable institutional equity reflects the fraction of common shares outstanding which are held by institutional investors (Lee et al., 2008).

the *degree of internationalization*[130]. The hypothesis postulates that there is a stronger negative association in firms with a higher degree of internationalization, since such companies have higher information-processing needs which are, according to equity theory, better served under a more equitable pay setting. The empirical findings support this hypothesis.

Henderson and Fredrickson (2001) follow the same train of thoughts based on the *need for cooperation*. They established two opposing hypotheses:

1) According to equity theory, the moderation of a higher CEO-TMT pay gap and higher coordination demands is negatively associated with firm performance.

2) According to tournament theory, the moderation of a higher CEO-TMT pay gap and higher coordination needs is positively associated with firm performance.[131]

The empirical analysis provided some proof for both theories, depending on the measure of coordination needs used. In firms with more related diversification and a larger number of VPs, large CEO-TMT pay differentials were positively associated with firm performance. However, for companies with a higher number of businesses or a higher level of capital investment activity, CEO-TMT pay gaps were negatively associated with performance. Other measures for coordination needs which were tested are firm size and R&D activity. However, those measures were not significant.

Ang et al. (1998) compared different types of organizational control patterns as influencing factors on the association between CEO compensation gap and firm performance. However, the only significant relationship could be discovered for *firms managed by their owner*. In this case, the association was found to be positive which was interpreted as a reward for entrepreneurship.

Finally, Main et al. (1993) and Eriksson (1999) studied *team interdependence* as a moderator, measured by the proportion of profit center heads among the managers. They argued that a higher proportion of profit center heads reflects lower team

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[130] Firm internationalization is indicated through a composite measure comprising the proportion of foreign sales, the proportion of foreign production and geographic sales dispersion (Carpenter & Sanders, 2004).

[131] This hypothesis is grounded on the argument that a larger pay gap is costly and thus, only provides an efficient alternative to more intensive monitoring in case of high coordination needs (Henderson & Fredrickson, 2001).

interdependence, and in such situations, the association between pay differentials and firm performance should be positive. Both studies found no significant results on the influence of the proportion of profit center heads on the relationship between CEO-TMT compensation differentials and firm performance.

2.5 Implications of Theoretical Part

As has been shown in the literature review, it can be assumed that differences in executive compensation disparity affect resulting firm performance of the respective company. In the following subchapter, hypotheses will be derived on the basis of the insights gained in the literature review. Additionally, two hypotheses are formulated which stipulate the general association of CEO and TMT (excl. CEO) compensation sums with firm performance.

2.5.1 Hypotheses

At first, three general hypotheses are derived which indicate the relationships between: a) CEO compensation and firm performance; b) average TMT (excl. CEO) compensation and firm performance; and c) CEO compensation gap and firm performance. Secondly, three individual hypotheses (incl. three sub-hypotheses) regarding the impact of different moderating variables on the relationship between compensation gaps and firm performance are formulated.

Among the various measures that are available for compensation differences, CEO compensation gap was selected for the quantitative analyses of this study.[132] Therefore, the following hypotheses are all formulated based on CEO compensation gap.

Hypotheses on CEO / TMT Compensation and Firm Performance

Hypotheses 1 and *2* are formulated referring to agency theory. As explained in Chapter 2.2, agency theory considers compensation as an instrument to motivate managers to reach the performance targets set, as they know that this impacts their final compensation sum. Thus, it can be deduced that the higher the potential compensation sum to be received in case of good firm performance, the more

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[132] Cf. Chapter 1.5.2.

motivated are the managers to achieve these performance goals. Consequently, this cause-effect-relationship is reflected in the following hypotheses:

> *H1 The higher the CEO compensation, the better the firm performance.*
>
> *H2 The higher the average TMT compensation, the better the firm performance.*

Hypothesis on CEO Compensation Gap and Firm Performance

In accordance with tournament theory and arguing in line with, for example, Bloom (1999: 26) and Ang et al. (1998: 337), we assume that a larger CEO-TMT compensation disparity, measured as CEO compensation gap, will motivate executives to perform better and, thus, there will be a positive association between CEO compensation gap and firm performance. Hence, the third hypothesis refers to the general relationship between pay disparity and firm performance:

> *H3 The larger the CEO compensation gap, the better the firm performance.*

Hypotheses on Moderating Variables

The literature review in Chapter 2.4.2 presents a large number of moderating variables which were examined in past research and which were then grouped into three categories by the author of this dissertation. While the literature review aims at providing a comprehensive overview of the current state of research, the empirical part of this dissertation focuses on moderators of the group "CEO Characteristics" in Table 7. These moderators were selected since examining all potential moderating variables would go beyond the scope of this dissertation and CEO characteristics seem to be very directly related to issues of CEO compensation gaps and resulting motivational effects which are the topic of this thesis. Furthermore, the selected variables within the group "CEO Characteristics" had the following advantages: Firstly, the argument for a moderating effect of these factors seemed persuading;

secondly, the moderating factors yielded significant results in previous studies;[133] thirdly, the moderators allowed of making clear propositions which, if supported by the analyses, enable drawing conclusions about the validity of tournament theory; and finally, data for the Swiss sample of this study was available for these moderators.[134]

Based on the tournament theory ideas stipulated in Chapter 2.4.2, three main hypotheses (H4 to H6) for the individual moderating variables are formulated. *Hypothesis 5* is structured into three sub-hypotheses 5a, 5b, and 5c, which all relate to CEO recruitment factors.

CEO Age: We follow the tournament theory-based line of argument of Kale et al. (2009) which states a positive moderating effect of CEO age. The older the CEO, the closer they get to retirement. This in turn implies that there will be a CEO replacement soon, which serves as a motivational factor for potential CEO candidates within the TMT to exhibit more effort with the goal of being appointed to CEO. In the end, this should translate into better firm performance, under the assumption of constant pay gap levels. Therefore, *Hypothesis 4* is:

> H4 *If the CEO of a firm is close to retirement age, CEO compensation gap and firm performance are more positively related.*

CEO Recruitment: Three factors pertaining to CEO recruitment are considered as moderating variables in this thesis: These are "new CEO" and "outside CEO," as well as the combination of both ("New outside CEO"). These factors are assumed to have a negative moderating effect and are summarized in *Hypothesis 5*.

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[133] Extant research has shown that results may vary with the CEO-TMT compensation differential measures and firm performance measures used (e.g. Sharma & Huang, 2010). Therefore, it may still make sense to select certain variables based on a solid theoretical grounding, although they have displayed insignificant coefficients in past research.

[134] The variable "succession plan in place" which is also listed under "CEO Characteristics" was not tested in the quantitative analyses of this dissertation due to difficult data availability.

> *H5 If any of the CEO recruitment factors "New CEO," "Outside CEO," or "New outside CEO" is present, CEO compensation gap and firm performance are less positively related.*

Each of these factors will be discussed separately in the next section. The hypotheses are labeled as *Hypotheses 5a–5c*.

New CEO: If there has been a CEO replacement lately, the chance that another CEO replacement will take place soon is lower. This is thought to reduce motivation of TMT members according to tournament theory, since TMT members have less reason to expect a quick promotion of anyone among them to the CEO position. Hence, in line with Kale et al. (2009), it can be expected that in case of a new CEO officiating in a company, firm performance will be lower at a given compensation gap level.

> *H5a If a firm has a new CEO, CEO compensation gap and firm performance are less positively related.*

Outside CEO: Following tournament theory, we argue that tournament incentives of TMT members are expected to decrease if the officiating CEO was not hired from the intra-firm talent pool, but from outside the company. Consequently, TMT members have less reason to expect that a new CEO will be recruited from their ranks, which lowers their motivation to excel in order to position themselves as potential CEO candidates (cf. also Kale et al., 2009). This leads to lower firm performance at a given pay gap level.

> *H5b If the CEO was hired from outside the firm, CEO compensation gap and firm performance are less positively related.*

New outside CEO: As detailed by Kale et al. (2009), if a new CEO hired from outside the firm has taken office lately, this should decrease motivation of other TMT members even more. In such a case, their chance of being promoted to CEO within the next time is quite low, not only because a new CEO is officiating, but also because

the current CEO was not selected among the existing TMT. Therefore, tournament incentives are even lower than if only one of these factors was present which should result in even lower firm performance.

> *H5c If a firm has a new CEO who has been hired from outside the firm, CEO compensation gap and firm performance are even less positively related.*

CEO Duality: Unity of the position of CEO and chairman of the board is considered as a sign for a strong CEO, as highlighted especially in US-based literature. It follows from this proposition that in cases of CEO duality, it is less likely that the CEO will be replaced shortly and as a result, promotion incentives within the TMT tend to be lower. According to tournament theory, TMT members consequently exert less effort (Kale et al., 2009) which leads to lower firm performance. As CEO duality occurs much less frequently in Switzerland than in the US (cf. Chapter 2.1.2), not having a chairman-CEO in place is much less a sign of a weak standing of the CEO in Switzerland than in the US. However, CEO duality can still be considered as a sign for a rather firmly installed CEO.[135] Hence, *Hypothesis 6* is:

> *H6 In case of CEO duality, CEO compensation gap and firm performance are less positively related.*

2.5.2 Conceptual Framework

The conceptual framework illustrated in Figure 13 shows the cause-effect relationships in connection with the hypotheses derived above.

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[135] Furthermore, leaving tournament theory, Lee et al. (2005) argue that CEO duality can be seen as a feature of less effective corporate governance, which should weaken the positive association between pay dispersion and firm performance.
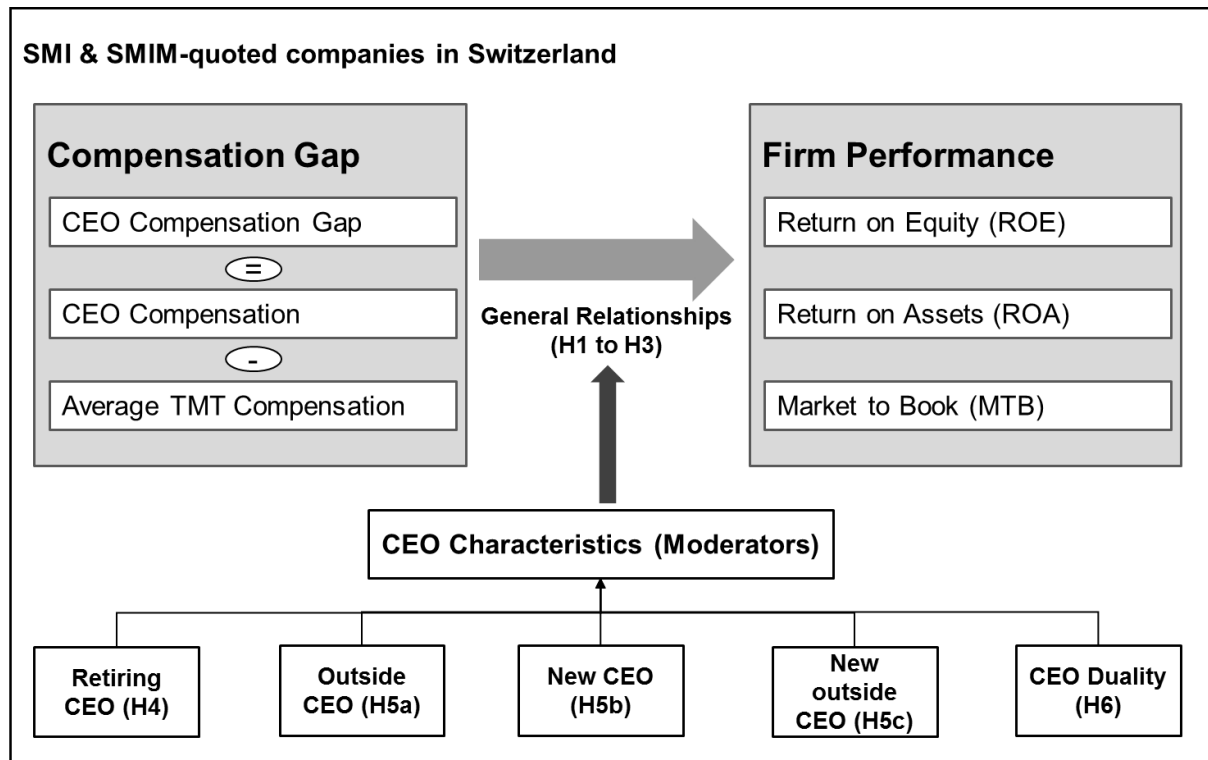
Figure 13: Conceptual Framework

Based on tournament theory, it is hypothesized that larger compensation gaps are associated with better firm performance. The relationship between pay gaps and firm performance is expected to be moderated by several CEO characteristics.

Overall, the elements of the model depicted in the conceptual framework can be classified into two groups:

- H1–H3: The hypotheses regarding the positive link between CEO / TMT compensation and firm performance, as well as the general hypothesis that the link between compensation gap and firm performance is basically positive.

- H4–H6: A set of moderators which are assumed to strengthen or weaken the basic relationship between compensation gap and firm performance.

These components of the model are complemented by a set of control variables to ensure that the results of the regressions are not biased by factors such as company size (not illustrated in the conceptual framework).

3 Specific Empirical Part

In the empirical part of the dissertation, the hypotheses formulated in the previous chapter are quantitatively tested. The chapter contains information on the research methodology (Chapter 3.1), presents the descriptive statistics (Chapter 3.2) as well as the inferential statistics (Chapter 3.3), followed by robustness tests (Chapter 3.4). Subsequently, the results are discussed (Chapter 3.5) and the limitations of the study are highlighted (Chapter 3.6).

3.1 Research Methodology

In order to be included in the sample of this study, companies have to fulfill certain selection criteria. These are described in the following subchapter on the characteristics of the sample. The second subchapter deals with the definition of the variables which form the quantitative analysis model as well as with their data sources. In the third subchapter, information on the data analysis procedure is provided, including the formulation of the regression models.

3.1.1 Sample

The sample is based on panel data[136] of companies quoted on the Swiss stock exchange (SIX) which are part of either the SMI or the SMIM indices. As a major data source, the annual compensation studies "Executive Remuneration Survey"[137] by Ethos for the years 2007, 2008, 2009, and 2010 were used.[138]

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[136] For most firms in the sample, there will be several observations over the four-year period.

[137] Permission for the use of the data of their reports 2007–2009 was given by Ethos on January 21, 2011, and for their report of 2010 on July 14, 2011.

[138] It is noteworthy that 2007, the beginning of the recent financial crisis, is the first year included in the sample and according to the Swiss National Bank (SNB), the financial crisis is still ongoing in 2013 (Swiss National Bank, 2013). The sample was chosen based on the availability of data and favoring timeliness of data. Anyhow, these special general conditions might somewhat reduce generalizability of results, but it could be argued as well that a certain degree of instability was characteristic of the financial markets in recent times so that it could also render results even more representative. Furthermore, including time periods in which the financial crisis had different extents in one overall sample adds variance to the observations which is also conducive to more meaningful results.

For 2007, Ethos reported on 48 firms, the 2008 report contained 47 firms, the 2009 report is made up of 49 firms and in 2010, again 48 firms were covered. The compensation figures indicated by Ethos may not exactly correspond to the indications in the annual reports of the covered companies, since Ethos performed some minor adjustments to make the data comparable among the sample companies. These adjustments included, for example, consistent valuation of shares based on market values for all firms (correcting e.g. for missing valuations or discounts on the market value), consistent calculation of option values based on the Black-Scholes formula for the day of allocation of options (correcting e.g. for the use of the binominal model or calculation of tax values) and exclusion of sign-on bonuses and termination pay from total compensation sums of a certain year.[139] Since the firms covered in these reports will be aggregated to one large sample, this would add up to 192 firm-year observations. However, several companies had to be excluded from the sample mainly due to the following reasons:

- Companies in which the highest paid member of the executive board was not identical to the CEO, as this would not fit the definition of CEO compensation gap.[140]

- Companies with inconsistent data, e.g. when the compensation sum indicated for the highest paid member of the executive board was lower than average TMT member pay, which would result in a negative CEO compensation gap.[141]

- Companies displaying insufficient data, e.g. no or incomplete publication of compensation sums required for the calculations in this dissertation.

This results in a basic sample of 168 firm-year observations with 54 different firms. The number of different firms in the overall sample is higher than the highest yearly firm figure (which was 49 in 2009) due to changes in the firms included in the SMI and SMIM indices over the four year period. Since not all firms are included every

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[139] For more detailed information on the adjustments performed, compare the appendices of the mentioned Ethos reports.

[140] The situation that the CEO was not the highest paid manager was found mainly in banks.

[141] A log transformation is applied to the values of CEO compensation gap before including them in the regressions. This transformation cannot be calculated based on negative CEO compensation gap values. Consequently, these observations are dropped from the sample.

year, but there are changes in the composition, the final sample contains 54 different companies.

Furthermore, the basic sample is split up into subsamples, for which compensation gaps of short-term and long-term forms of compensation were calculated (cf. Chapter 3.1.2). These were also used for examining the relationship of CEO-TMT compensation disparity and firm performance in more detail. As a result, sample sizes varied for the different analyses of the inferential statistics in Chapter 3.3 (excl. robustness tests) between 127 and 168 firm-year observations.[142] In addition, sample size had to be adapted for the fixed effects regressions which were performed as robustness tests (cf. Chapter 3.4.1), as single firm observations had to be eliminated.

3.1.2 Operationalization of Variables

This subchapter defines the variables which are included in the regression model of this dissertation, describing their measurement and data sources. The variables are presented based on the following structure: a) Firm performance measures (dependent variables), b) compensation measures (variables of interest), c) control variables and d) moderating variables. Table 8 provides an overview of these variables. Subsequently, each variable is discussed in detail.

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[142] Since sample size has an important impact on the statistical power of inferential tests (Cohen, 1988), especially in the case of multiple moderated regressions, a sample size of more than 120 is recommended to ensure detection of moderating effects. For sample sizes of less than 120, even medium or strong moderating effects often remained undetected (Stone-Romero & Anderson, 1994).

Variable acronym	Variable name and definition	Units
Dependent Variables: Firm Performance		
ROE	Return on Equity	%
ROA	Return on Assets	%
MTB	Market-to-book	Multiple
Independent Variables 1: Compensation Measures		
TOTALGAP	Total CEO Compensation Gap	CHF
LTGAP	Long-term CEO compensation gap	CHF
STGAP	Short-term CEO compensation gap	CHF
CEOCOMP	Total compensation of CEO (= highest-paid TMT member)	CHF
TMTCOMP	Average total compensation of TMT members (excl. CEO)	CHF
Independent Variables 2: Control Variables		
SIZE	Firm size measure (Number of employees measured in FTEs)	FTE
DUAL	CEO Duality (1, if CEO is at the same time Chairman of the BoD, otherwise 0)	(0, 1)
LEV	Firm Leverage (Total liabilities / Total assets)	%
CEOAGE	Age of CEO (as proxy for experience)	years
TMTCOUNT	Number of managers listed in the annual report as belonging to the TMT (excl. CEO)	#
YEAR	Dummy variables for year of respective data points	(0, 1)
INDUSTRY	Industry dummy variables according to ICB-classification	(0, 1)
Independent Variables 3: Moderating Variables		
RETCEO	Retiring CEO (1, if > 62, otherwise 0)	(0, 1)
NEWCEO	New CEO (1, if the CEO has taken office in that year, otherwise 0)	(0, 1)
OUTCEO	CEO hired from outside the firm (within one year before becoming CEO)	(0, 1)
NEWOUTCEO	New CEO (v.s. for definition) who has been hired from outside the firm	(0, 1)
DUAL	see above in control variables section	(0, 1)

Table 8: Description of Variables

Firm Performance Measures (Dependent Variables)

Firm performance is measured with three different performance measures[143]:

- *Return on equity (ROE)* is defined as net income divided by average shareholders' equity. It reflects the proportion of net income that has been generated based on the capital provided by investors, thus, excluding debt capital (Hutzschenreuter, 2009: 99). Therefore, ROE constitutes an important ratio for shareholders.

- *Return on assets (ROA)* is defined as net income divided by average total assets. It is a widely used firm performance measure in studies on executive compensation,[144] since it expresses *"the efficiency with which a firm employs its current asset base"* (Carpenter & Sanders, 2002: 371). While such accounting-based measures do not reflect information on a firm's strategic positioning and its future profitability outlook (Brealey & Myers, 1991), they are less volatile than market-based profitability measures.

- *Market-to-book (MTB)* is a more market-based performance measure. It is defined as the end-of-year market price divided by the book value per share. While the market price in the denominator of the calculation equation reflects both current performance and the markets' expectations of future performance, the book value in the nominator reflects more directly concrete managerial actions taken (Mayr, 2011: 51).

These general measures were selected for two major reasons: Firstly, ROA, ROE and MTB constitute measures frequently used in extant research. Thus, using similar measures should enhance comparability of results. Secondly, it has been shown in extant studies that results vary with the performance measures selected (e.g. Main et al., 1993). As the selected measures reflect operating performance and stock market performance, they represent several dimensions of firm performance.

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[143] For a detailed definition of ROE, compare Thomson One Field No. 08301. ROA is defined according to Thomson One Field No. 08326 and MTB according to Thomson One Field No. 09304.

[144] Compare, for example, Main et al. (1993), Conyon et al. (2001), Henderson and Fredrickson (2001), Carpenter and Sanders (2002, 2004), Jonas (2007), Lee et al. (2008), Bebchuk et al. (2009), and Kale et al. (2009).

For each of these performance measures, separate regressions are performed. The data is retrieved from Thomson One Banker for the respective years 2007 to 2010.

Compensation Measures (Variables of Interest)

The compensation measures used in the study are CEO compensation, average TMT compensation and CEO compensation gap. For the inclusion of the compensation figures in the regressions, CEO compensation and CEO compensation gap are transformed by applying the natural logarithm (ln), while average TMT compensation is transformed by $(1/(\sqrt{x}))$.[145]

CEO compensation and average TMT compensation build the basis for the calculation of CEO compensation gap. CEO compensation gap is calculated as the compensation difference between the CEO and the average compensation of the other TMT members. The formula below exemplifies the calculation method (cf. also Chapter 1.5.2):

CEO compensation gap = CEO compensation

                              − average TMT compensation (excl. CEO)

Firstly, *CEO compensation* is used in the calculation of pay differentials. In some instances, there were interim CEOs in office. As those take office only to bridge the gap until a new CEO is nominated and, as a result, the competition for becoming the next CEO is still going on, the compensation of interim CEOs is not taken into account in this study.[146]

Secondly, *average TMT compensation* enters into the calculation of CEO compensation gaps and is defined as the average compensation attributed to the members of TMT, excluding the CEO. Since in Switzerland only the compensation of the highest paid member of the executive board, as well as the compensation of the

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[145] Cf. Chapter 3.2.2 for further details on the transformations applied.

[146] In years when the former CEO left and an interim CEO took charge, the annualized data for the former CEO were used, unless a new CEO assumed office within the same year. If the latter was the case, the higher annualized compensation of the former and the new CEO was used for calculation of the CEO compensation.

other executive board members as a whole has to be published according to Art. 663b^{bis} of the Swiss Code of Obligations, the number of TMT members whose compensation is entered in the calculation of average TMT compensation may vary among the organizations represented in the study, depending on how many executives are represented in the published TMT compensation figure. Nevertheless, Henderson and Fredrickson (2001) argue that the variance in the number of TMT members included should not considerably alter the size of the calculated pay gap since the largest compensation gap within the executive board typically occurs between the CEO and the manager with the next highest compensation. Compensation of the following highest-paid managers is typically rather close to the compensation of the highest earning non-CEO (Lambert et al., 1993).[147] Therefore, the average value of non-CEO TMT compensation should not fluctuate to a great extent with the number of TMT members whose compensation is included in the total TMT compensation sum.

This approach of calculating average compensation is different from the approach used in most studies on executive board compensation based on US data, due to the fact that US studies are usually based on Compustat's ExecuComp data, which indicates the compensation figures reported in firms' proxy statements. According to SEC regulations, firms have to publish the compensation of the CEO as well as of each of the next four highest paid executives separately. These executives do not necessarily have to constitute the complete top management team (i.e. all direct reports to the CEO) and thus, adding their individual compensation figures and averaging this number does not necessarily correspond exactly to average TMT compensation, but this calculation process based on the four highest non-CEO compensation figures provides a relatively good approximation of average TMT compensation (Carpenter & Sanders, 2002: 370).

Regarding the frequently encountered difficulties to prove the link between pay and performance, and the often weak or non-existent relationships between these variables in cross-sectional studies, Henderson and Fredrickson (2001: 107) propose to use long-term compensation gap as a predicting variable in regressions of firm

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[147] The author of this thesis assumes that this reasoning is not only specific to US firms, but also holds for Swiss-based companies, even though eventually less strongly.

performance, since it is expected to show a stronger link with performance measures than total compensation gap or especially short-term compensation gap. To take this into account, separate analyses are performed for total compensation gap, long-term compensation gap and short-term compensation gap in the empirical section of this study.

For the calculations of total compensation gaps, long-term compensation gaps and short-term compensation gaps, the following definitions of compensation categories are applied: *Short-term compensation* comprises base salary, cash bonus and other forms of compensation which contain pension fund contributions and payments in-kind.[148] It might also be termed cash compensation. *Long-term compensation* is defined as all other compensation components, such as share plans, stock options and long-term incentive plans. Finally, *total compensation* equals the sum of short-term and long-term compensation.[149]

The data required for calculating CEO compensation gaps stems from the Ethos "Executive Remuneration Survey" studies for the years 2007–2010.

Control Variables

The following variables are to be included in the regression models as control variables based on strong theoretical support: Firm size, CEO duality, firm leverage, CEO age, number of TMT members, year, and industry classification. These variables are controlled since it is assumed that they might complement the aforementioned compensation variables (CEO compensation gap, CEO compensation and average TMT compensation) as additional predictor variables of firm performance (Hamilton, 2004: 178) or be related to these compensation variables. Therefore, control variables might also add to the explanatory power of the regression model since they take into account the possibility that the observed performance effects might not be explained solely by the variables of interest (i.e. the compensation variables), but might be linked to other important independent variables. Yet, the selection of control variables is rather restrictive in order to maintain an adequate ratio of observations to variables.

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[148] A common example for payments in kind are company cars.

[149] These definitions are in line with, for example, Conyon et al. (2001: 809).

Firm size is a common control variable in executive compensation models (cf. Conyon et al., 2001: 809). It is assumed to be positively linked with the level of executive compensation.[150] Rosen (1982) argues in this respect that larger companies tend to be managed by more talented executives. He further assumes that CEO abilities have an influence on the productivity of lower level workers, so that a leverage effect occurs when a firm has a very talented CEO. Consequently, the vast executive compensation sums which are frequently observed in large companies may be justified by increases in productivity and firm performance due to a highly talented CEO. Firm size is measured by the natural logarithm of the firms' number of employees (used, e.g., by Henderson & Fredrickson, 2001: 103). The data is available in the Ethos studies and is measured in full-time equivalents (FTEs).

The inclusion of *CEO duality* as a control variable is based on the argument by Core et al. (1999) that firms with CEO duality possess a weaker corporate governance level which is expected to lead to lower performance and firm value. This idea is supported, for example by Weichsler (2009) who finds a positive association between the quality of corporate governance in Swiss firms and their shareholder value. In this dissertation, duality is coded as a dummy variable, taking the value "1" if the CEO also chairs the board of directors or else it figures as "0." Information regarding CEO duality is mentioned in the Ethos reports and was manually checked based on the information available in the firms' annual reports. For the control variable CEO duality, a moderating relationship with CEO compensation gap is assumed as well, which means that it is additionally expected to have an indirect impact on firm performance, by impacting the strength and/or direction of the relationship between CEO compensation gap and firm performance.[151] Thus, it is included as a control variable in all basic regression models and extended models for testing moderating effects, but at the same time constitutes a moderating variable itself and is tested as such in the moderated regressions relating to *Hypothesis 6*.

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[150] This is also reflected in the differing compensation levels of SMI versus SMIM firms illustrated in Chapter 2.1.1.

[151] Compare Chapter 3.1.3 for a more detailed description of the differentiation between control variables and moderating variables.

Firm leverage is used as a control variable since extant research has indicated that leverage and firm performance are linked (e.g. Campello, 2006; Phillips, 1995) and leverage has been shown to constitute a significant control variable with negative regression coefficients in various studies on executive compensation distributions (e.g. Bebchuk et al., 2009; Kale et al., 2009; Lin & Lu, 2009). Leverage is defined as the ratio of debt to total assets, calculated as total liabilities over total assets. The data was retrieved from Thomson One Banker.

In line with Conyon et al. (2001: 809), *CEO age* is employed to approximate and control for CEO experience. According to Hill and Phan (1991), CEO experience is a characteristic influencing executive pay and, moreover, it could be assumed that the level of experience of a CEO may impact firm performance. CEO age was collected manually from the firms' annual reports, firms' webpages and press research.

TMT size is controlled in the regressions since it could be linked with the size of CEO compensation gaps, e.g. because in larger TMTs, the different TMT positions might be more diverse than in smaller TMTs, leading to greater differences in compensation which could, for example, lower average TMT compensation (Siegel & Hambrick, 2005: 266). Henderson and Fredrickson (2001: 112), however, found evidence that firms with a larger number of vice presidents (VPs) had smaller CEO compensation gaps. Moreover, Haleblian and Finkelstein (1993: 855) detected a positive link between TMT size and firm performance, which is particularly strong in less stable environments. Therefore, TMT size is controlled in the regressions of this dissertation, measured as the number of TMT members (excl. CEO) as indicated in the "Executive Remuneration Survey" studies by Ethos.

Extant research has shown that a firms' *industry classification* has a major impact on compensation practices (e.g. Yermack, 1995; Stern & Peck, 2003). Hengartner (2006: 133) found that top managers in the Swiss financial services industry earn a pay premium of 55% and in the healthcare industry of 40% relative to their peers in the basic material industry. The technology industry showed a pay premium of 20%, while the pay levels in consumer goods, industrial goods and utilities were about comparable to those in the basic materials industry. This underlines that compensation practices vary with industry affiliation and, therefore, industry-affiliation should be included in the regressions. However, due to the limited number of firms within each

industry and year, the author refrained from calculating industry-adjusted performance measures in the main empirical analyses.[152] Therefore a firms' industry classification is controlled for in the regressions by means of industry dummies. The ICB (Industry Classification Benchmark)[153] classification grid was used to determine the industry affiliation of the sample companies. The respective data was retrieved from Thomson One Banker.[154]

Furthermore, the *year* of firm-year observations is controlled by means of dummy variables.

Moderating Variables

As highlighted in Chapter 2.5.1, five moderating variables are to be tested in this study. The operationalization of these moderating variables depends to a large extent on the literature review to ensure comparability of results. The variables RETCEO, NEWCEO, OUTCEO and NEWOUTCEO are defined in accordance with Kale et al. (2009). *RETCEO* measures whether the CEO is close to retirement age. The dummy variable for RETCEO equals "1" if the CEO is above 62 years; otherwise, it is "0." *NEWCEO* indicates if the CEO has taken office within that year. In this case, the variable equals "1" or else it is "0." *OUTCEO* specifies if the CEO has been hired from outside the firm. This is considered to be the case if the CEO joined the firm within less than one year before becoming CEO. OUTCEO is measured as a dummy variable, too, equaling "1" in cases when the CEO has been hired from outside the firm. *NEWOUTCEO* combines the previous two moderating variables. If a new CEO has taken office within that year and had been hired from outside the firm, the dummy variable equals "1"; otherwise, it equals "0." It is generated by interacting NEWCEO and OUTCEO. While the data for RETCEO is calculated based on the CEO age variable, the data for NEWCEO and OUTCEO is retrieved from the aforementioned Ethos reports 2007 to 2010 and supplemental manual research in the firms' annual

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[152] Regressions with industry-adjusted firm performance were calculated as a robustness test based on a limited sample (cf. Chapter 3.4.3).

[153] The ICB-classification differentiates between ten industry groups and allocates a four-digit code to each firm, which specifies the exact field of activity of a firm. The first figure of this four-digit code denotes the industry group, which was used for this study (http://www.icbenchmark.com/).

[154] For more details regarding the industry classification, refer to Chapter 3.2.1.

reports and press research. The dummy variable *DUAL* has already been discussed above in the section on control variables.

3.1.3 Data Analysis Methodology

For analyzing the association between executive compensation distribution and firm performance, linear regression models are used. These analyses aim at addressing research questions 2 and 3 which were formulated in Chapter 1.3[155]:

- *Research question 2:* The association between CEO-TMT compensation disparity and firm performance is addressed by means of regressions of firm performance on different kinds of CEO compensation gaps (i.e., total gaps, long-term gaps, short-term gaps) and control variables. Additionally, the link between CEO compensation and average TMT compensation with firm performance is tested. These analyses rely on regressions of firm performance on CEO compensation or average TMT compensation, and control variables.

- *Research question 3:* The existence of moderating variables of the relationship between CEO compensation gap and firm performance is examined via various moderated regressions of firm performance on CEO compensation gap, moderating variables and control variables.

By means of Ordinary Least Square (OLS) regressions, the relationship between various independent variables and firm performance as the dependent variable is examined. The general regression equation is specified as follows:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \ldots + \alpha_k X_k + \varepsilon$$

Y stands for the dependent variable, X_k is the kth independent variable, α_0 is a constant (the intercept), α_k is the regression coefficient for variable X_k and ε stands for the error term. For the regressions of firm performance on compensation gaps (without moderating variables) as well as on CEO and TMT compensation, the following basic regression model is derived from the general equation above:

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[155] Research question 1 was addressed mainly in Chapters 1.5.2 and 2.4, and research questions 4 and 5 rely on interpretations of the results gained in the following quantitative analyses.

Basic regression model for H1–H3:

Performance = α_1 + α_2 COMPENSATION MEASURE$_{it}$ + α_3 SIZE$_{it}$ + α_4 DUAL$_{it}$
+ α_5 LEV$_{it}$ + α_6 CEOAGE$_{it}$ + α_7 TMTCOUNT$_{it}$ + α_8 YEAR$_t$
+ α_9 INDUSTRY$_{it}$ + ε_{it}

In this formulation, the subscripts denote firm i in year t (t = 2007–2010). This basic model contains only the dependent variable which is firm performance, and the independent variables which are the respective compensation measure and the control variables. Since the base model is employed for the regressions with CEO compensation gap, as well as for CEO compensation and TMT compensation as compensation measures, the model formulation above contains the general term "COMPENSATION MEASURE" for which CEO compensation gap (TOTALGAP, LTGAP or STGAP), CEO compensation (CEOCOMP) and average TMT compensation (TMTCOMP) can be substituted. This model solely serves to test *Hypotheses 1–3* regarding the general relationships. Therefore, the moderating variables are not contained in this base model. To examine the moderating effects, the base model is then extended (see below).

According to Frazier, Tix and Barron (2004: 116), the analysis of moderation effects addresses the questions "when" or "for whom" a variable is most strongly associated with a certain dependent variable. In this sense, *"a moderator is a variable that alters the direction or strength of the relation between a predictor and an outcome"* (Frazier et al., 2004: 116). In other words, in case of a moderating effect, an interaction takes place, meaning the level of one variable influences the impact of another. The difference between direct effects of variables and moderating effects is illustrated in Figure 14.

A) Direct Effects

Predictor variable (x)   Outcome variable (y)
(i.e. CEO compensation gap)   (i.e. firm performance)

B) Moderating Effects

Predictor variable (x)   Outcome variable (y)
(i.e. CEO compensation gap)   (i.e. firm performance)

Moderator variable (z)
(e.g. NEWCEO)
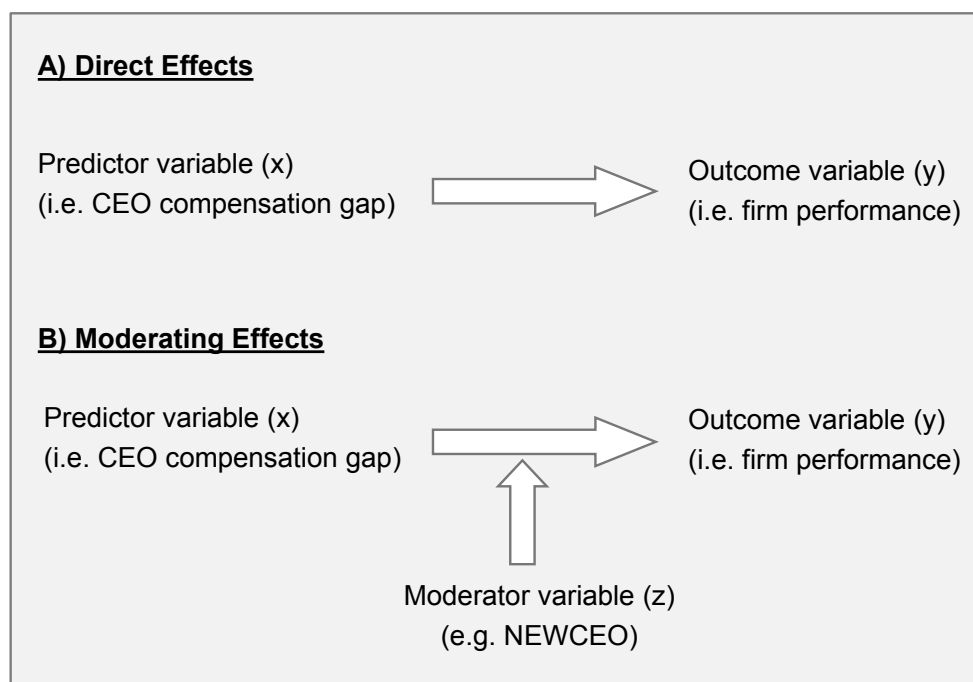
Figure 14: Direct Effects and Moderating Effects[156]

Moderators are frequently used when relations between a predictor and an outcome variable are weaker than expected or inconsistent in several studies (Baron & Kenny, 1986), a problem which is common to studies on executive compensation as shown in the literature review on compensation disparities (cf. Chapter 2.4.1). Therefore, examining potential intervening variables will clarify whether the relationship may be stronger or weaker under certain circumstances.

When performing regressions with moderating terms, all individual variables which constitute the moderating terms have to be included in the regression model by themselves, too, since the moderator effect would be mixed with the effects of the predictor and moderator variable if the variables of which the moderating term consists were not controlled for (Judd, McClelland, & Culhane, 1995; West, Aiken, & Krull, 1996). Consequently, adding all moderating terms simultaneously to the regression equation would result in a large number of independent variables. However, such a large number of variables is not desirable in order to maintain a sensible ratio of variables to observations. Hence, the moderating variables and

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[156] Source: On the basis of Frazier, Tix, and Barron (2004: 116).

moderating terms are not added simultaneously to the basic regression model, but alternately.[157]

The following equation illustrates how the basic regression model is extended to test the moderating effects, exemplified for the moderating variable NEWCEO:

Exemplary moderated regression model for H4–H6:

$$\text{Performance} = \alpha_1 + \alpha_2\,\text{TOTALGAP}_{it} + \alpha_3\,\text{SIZE}_{it} + \alpha_4\,\text{DUAL}_{it} + \alpha_5\,\text{LEV}_{it}$$

$$+\,\alpha_6\,\text{CEOAGE}_{it} + \alpha_7\,\text{TMTCOUNT}_{it} + \alpha_8\text{YEAR}_t$$

$$+\,\alpha_9\,\text{INDUSTRY}_{it} + \alpha_{10}\,\text{TOTALGAP}_{it}*\text{NEWCEO}_{it}$$

$$+\,\alpha_{11}\,\text{NEWCEO}_{it} + \varepsilon_{it}$$

In this regression model, TOTALGAP is included in place of COMPENSATION MEASURE, since these regressions are only performed with TOTALGAP (cf. Chapter 3.3). Due to the presence of heteroscedasticity in the models,[158] all regressions use heteroscedasticity robust (i.e. Huber-White robust) standard errors.

3.2 Descriptive Statistics

This chapter contains the descriptive statistics, subdivided into general sample statistics (Chapter 3.2.1) and variable statistics (Chapter 3.2.2). This is followed by the analysis of the correlation coefficients (Chapter 3.2.3).

3.2.1 Sample Statistics

The panel data of the four-year period (2007–2010) yields a basic sample of 168 observations which represent 54 different companies (cf. Chapter 3.1.1). According to the ICB-classification grid, these 168 observations are split up into nine different industry groups (cf. Table 9). Four of these industries make up more than 80% of the total number of observations: The largest industry groups are industrial firms (27%),

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[157] This approach is also used, for example by Siegel and Hambrick (2001: 269) who test moderators on a limited sample of 42 to 66 data points by including each moderating term in a separate regression.

[158] Heteroscedasticity was tested using the Breusch-Pagan/Cook-Weisberg test in Stata.

followed by financial firms (22%), healthcare companies (19%), and consumer goods companies (12%). The remaining five industry sectors each represent 7% or less of total observations. The industry breakup described above remains relatively constant over the years.

				ICB Industry Classification of Sample Firms		
Weighting	**Industry**	**Code**	**Weighting**	**Supersector**	**Code**
27.4%	Industrials	2000	20.2%	Industrial Goods & Services	2700
			7.1%	Construction Materials	2300
22.0%	Financials	8000	11.3%	Insurance	8500
			6.6%	Banks	8300
			2.4%	Real Estate	8600
			1.8%	Financial Services	8700
19.0%	Health Care	4000	19.1%	Health Care	4500
11.9%	Consumer Goods	3000	7.7%	Food & Beverage	3500
			4.2%	Personal & Household Goods	3700
7.1%	Basic Materials	1000	7.1%	Chemicals	1300
4.2%	Technology	9000	4.2%	Technology	9500
3.6%	Oil & Gas	0001	3.6%	Oil & Gas	500
2.4%	Consumer Services	5000	1.8%	Retail	5300
			0.6%	Travel & Leisure	5700
2.4%	Telecom	6000	2.4%	Telecommunications	6500

Table 9: Weighting of Industry Groups within the Company Sample

Of the 168 observations, 70 are from SMI companies (42%), while 98 are from SMIM companies (58%). With respect to the annual split-up, the sample contains 42 observations for the year 2007, 41 for the year 2008, 44 for 2009, and 41 for 2010 (cf. Figure 15).[159] This shows that the sample is fairly balanced in terms of observations per year.

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[159] For further information on the sample composition refer to Chapter 3.1.1.
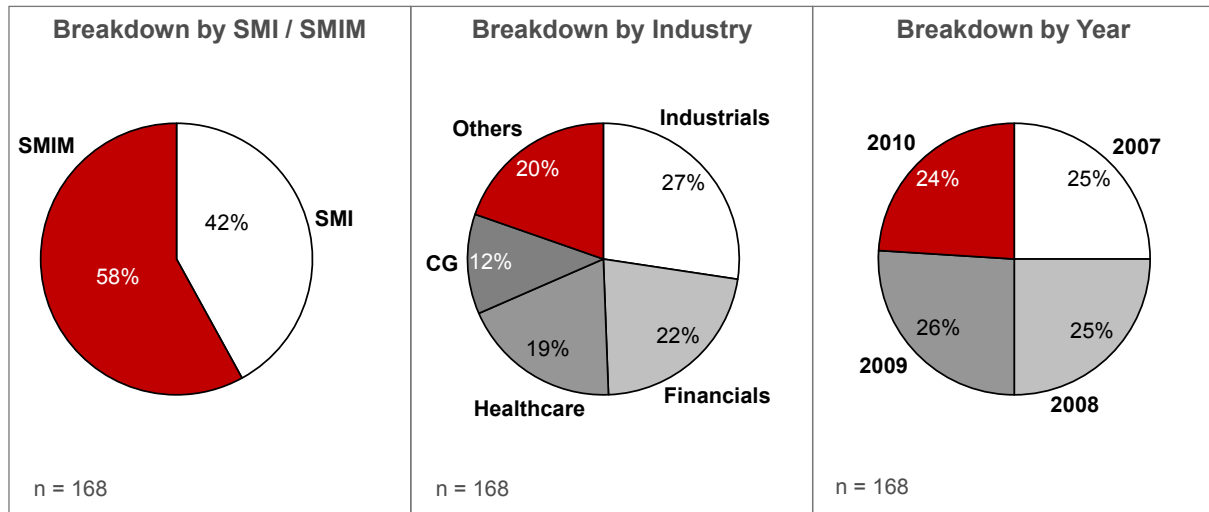
Figure 15: Index and Industry Affiliation, and Annual Observations

3.2.2 Variable Statistics

Table 10 represents the summary statistics (mean, median, standard deviation, as well as minimum and maximum values) of the variables used in the regressions. The findings of this table are discussed below, structured according to the classification of the variables into firm performance variables (dependent variables), compensation variables (variables of interest), control variables, and moderating variables.

The table shows the units of measurement and sample size (N), as well as the mean, median, standard deviation (Std. Dev.), minimum (Min.) and maximum (Max.) values of all variables included in the regression models. Log transformations (ln) have been applied to all compensation variables (except for TMTCOMP), as well as to MTB, SIZE and TMTCOUNT. TMTCOMP is transformed by $(1/(\sqrt{x}))$. Sample sizes varied due to missing values for MTB, long-term gap (LTGAP) and short-term gap (STGAP). The control variables YEAR and INDUSTRY are not included in the table for reasons of lack of relevance of these statistical parameters.

Variable	Units	N	Mean	Median	Std. Dev.	Min.	Max.
Dependent Variables: Firm Performance							
ROE	%	168	15.76%	16.61%	19.89%	-81.17%	102.95%
ROA	%	168	7.34%	8.20%	9.59%	-45.15%	31.88%
MTB	Multiple	166	3.17	2.53	2.66	0.30	20.59
ln(MTB)		166	0.89	0.93	0.73	-1.20	3.02
Independent Variables 1: Compensation Measures							
TOTALGAP	CHF	168	3'676'529	2'369'640	4'754'743	103'167	35'700'000
ln(TOTALGAP)		168	14.57	14.68	1.08	11.54	17.39
LTGAP	CHF	131	2'421'847	868'475	4'746'384	14'803	33'500'000
ln(LTGAP)		131	13.71	13.67	1.46	9.60	17.33
STGAP	CHF	141	1'640'298	1'135'753	1'466'266	96'045	8'914'168
ln(STGAP)		141	13.92	13.94	0.94	11.47	16.00
CEOCOMP	CHF	168	5'796'651	4'010'963	5'965'212	930'824	42'200'000
ln(CEOCOMP)		168	15.24	15.20	0.79	13.74	17.56
TMTCOMP	CHF	168	2'120'122	1'641'729	1'797'075	649'900	13'000'000
TMTCOMP $(1/(\sqrt{x}))$		168	0.0008	0.0008	0.0002	0.0003	0.0012
Independent Variables 2: Control Variables							
SIZE	FTE	168	28'289	10'457	48'144	76	283'000
ln(SIZE)		168	9.27	9.26	1.55	4.33	12.55
DUAL	(0, 1)	168	0.13	0.00	0.34	0.00	1.00
LEV	%	168	57.98%	57.50%	21.95%	14.35%	97.97%
CEOAGE	YEARS	168	52.6	53.0	6.8	35.0	66.0
TMTCOUNT	#	168	6.6012	6	3.6512	1	20
ln(TMTCOUNT)		168	1.74	1.79	0.55	0.00	3.00
Independent Variables 3: Moderating Variables							
RETCEO	(0, 1)	168	0.09	0.00	0.29	0.00	1.00
NEWCEO	(0, 1)	168	0.17	0.00	0.38	0.00	1.00
OUTCEO	(0, 1)	168	0.26	0.00	0.44	0.00	1.00
NEWOUTCEO	(0, 1)	168	0.05	0.00	0.21	0.00	1.00
DUAL	(0, 1)	168	0.13	0.00	0.34	0.00	1.00

Table 10: Summary Statistics

a) Firm Performance (Dependent Variables)

The average ROE of the sample companies over the period of four years amounts to 15.8% while the average ROA is 7.3%. The comparison of the mean and median firm performance measures shows that ROE and ROA are relatively symmetrically distributed. The annual split-up of ROE and ROA is depicted in Figure 16. The highest average ROE was achieved in 2007 with 19.2%, while 2008 was the weakest year with an average ROE of 11.9%. The year 2009 was fairly better with an average ROE of 14.1%, and 2010 showed an average ROE of 17.1%. The fluctuation in ROA was much lower over the four years in the sample. As in the case of ROE, also the years 2007 and 2010 showed the strongest performance in terms of ROA with an average ROA of 8.4% in 2007 and 8.2% in 2010. For 2008, average ROA was 6.6% and for 2009 6.3%.
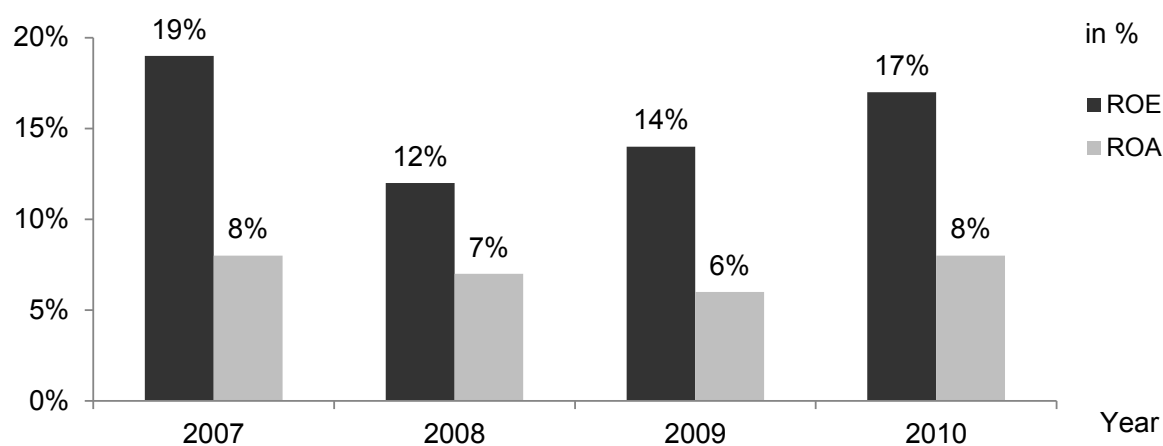
Figure 16: Average Annual Performance of Sample Companies

The distribution of the original MTB values is positively skewed,[160] which was eliminated by a logarithmic transformation. Thus, the log-transformed MTB mean and median also show a quite symmetric distribution. The mean of the MTB multiple is 3.17.

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[160] If a distribution is positively skewed (skewed to the right), it contains many relatively small values and a few very large values. As a result, the mean is larger than the median. In contrast, if a distribution is negatively skewed (skewed to the left), the mean is lower than the median: Most values within the distribution are rather large and only a few very small values are included (Lomax, 2007: 69).

b) *Compensation Measures (Variables of Interest)*

For the compensation measures, both the original figures and the transformed values are indicated in the table. Since the original compensation measures show a positively skewed distribution, all (except for TMTCOMP) are transformed by following the natural logarithm (ln) which renders relatively symmetrically distributed values.[161] The positively skewed distribution of the original variable total CEO compensation gap (TOTALGAP) indicates that most companies have lower compensation gaps than the mean, but a few companies display compensation gaps which are considerably larger than the mean. This can also be observed for the variables long-term compensation gap (LTGAP) and short-term compensation gap (STGAP), CEO total compensation (CEOCOMP) and average compensation figures of the TMT (TMTCOMP). The results of testing the ladder of power transformations (Tukey, 1977) in Stata led to the transformation of the positively skewed distribution of TMTCOMP by dividing 1 by the variables' square root $(1/(\sqrt{x}))$ in order to approximate a normal distribution, while the ladder of power transformations indicated log transformations for the remaining compensation variables. Moreover, all compensation variables display relatively large standard deviations.

The average total CEO compensation gap (TOTALGAP) amounts to CHF 3.68 million, but spans from CHF 103,167 to CHF 35.7 million, illustrating the broad spectrum of values included. This is even more striking for long-term compensation gap (LTGAP) which has a mean of CHF 2.42 million, and includes values from CHF 14,803 to CHF 33.5 million. The mean of short-term compensation gap (STGAP) is CHF 1.64 million, with a minimum of CHF 96,045 and a maximum of CHF 8.91 million, thus, having slightly less extreme disparities. When regarding absolute compensation sums for this sample, CEOs earn on average CHF 5.8 million, with total compensation sums ranging from a minimum below CHF 1 million (i.e. CHF 930,824) to a maximum of CHF 42.2 million. The average total compensation of TMT members (excl. CEO) is CHF 2.12 million for this sample. The lowest average TMT total compensation amounts to CHF 649,900, the highest to CHF 13.0 million.

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[161] Using log transformed compensation variables is also common practice in comparable executive compensation studies.

While in terms of firm performance, 2007 and 2010 were the strongest years within the sample period, the years 2007 and 2009 were the strongest with regard to compensation sums awarded and the resulting CEO compensation gaps. These observations apply to all three compensation measures depicted in the illustration, which are average CEO compensation, average TMT compensation (excl. CEO), and average total compensation gap. Figure 17 displays the annual total compensation sums as well as the variations of the compensation variables over the years.
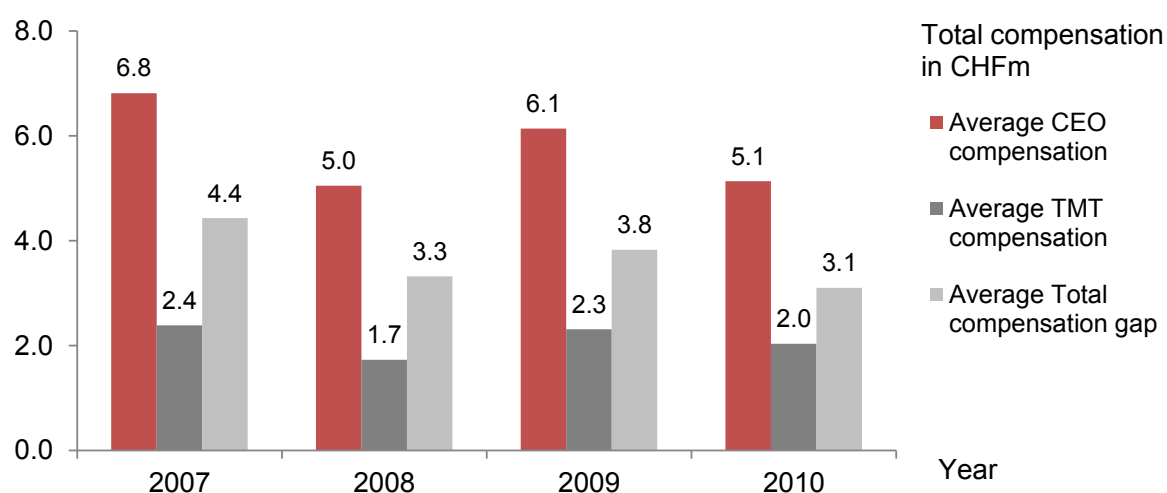
Figure 17: Average Annual Compensation Sums for Company Sample[162]

c) Control Variables

The firm size variable (SIZE) which is measured in terms of full-time employees (FTEs) shows a positively skewed distribution, too. Most firms have fewer FTEs than the mean; however, there are a few large firms in the sample with respect to FTEs. Each sample firm on average has 28,289 FTEs, while the minimum amounts to only 76 FTEs and the maximum to 283,000 FTEs. Owing to the positively skewed distribution of firm size, the variable was transformed by taking the natural logarithm of the original FTE values.

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[162] The average TMT compensation figures reflect the average TMT member compensation per firm, not per TMT member (this means that no weighting of the size of TMTs was included in the calculation of the average TMT sums, but the average sums per firm were used).

The CEO duality variable (DUAL) shows that in 13.1% of the observations in the sample, the CEO doubled as the chairman of the board of directors. This is a rather low figure compared to US studies in which the proportion of CEO duality is usually around 70%.[163] The average leverage (LEV) of the firm observations was 58.0%, including values between 14.4% and 98.0%. The average CEO age (CEOAGE) was 52.6 years. The youngest CEO was only 35 years of age, while the oldest CEO was 66. The number of TMT members (TMTCOUNT) oscillates between 1 and 20, averaging 6.6 persons.

d) Moderating Variables

The moderating variables provide further insights into the characteristics of the CEO and the TMT group. For 8.9% of the observations in the sample, the CEO was older than 62 years, as the variable retiring CEO (RETCEO) shows. In 17.3% of the TMT observations, the CEO had changed within that year (cf. variable NEWCEO). The variable outside CEO (OUTCEO) indicates that for 25.6% of the CEO observations, the CEO was hired from outside the firm, which implies that they had joined the firm within one year before becoming CEO. However, according to the variable "New outside CEO" (NEWOUTCEO), for only 4.8% of the CEO observations in the sample, a new CEO was appointed within the sample year who had been hired from outside the firm within one year before becoming CEO. Thus, in over 70% of the cases of CEO changes, the CEO was appointed from the talent pool inside the company.[164]

3.2.3 Correlation Analysis

Table 11 shows the Pearson correlation coefficients of the variables and their respective significance levels for the sample of ROE and ROA with 168 observations. Table 12 presents the Pearson correlation coefficients for the closely related sample of MTB with 166 observations. The large correlation coefficients (>0.5) to be found in these tables are firstly, between the performance measures ROE and ROA, secondly,

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[163] For US-based studies, Bebchuk et al. (2009) report CEO duality for 75% of their firm-year observations, while in the study of Kale et al. (2009), this percentage amounts to 67%. For more details about CEO duality, refer to Chapter 2.1.2.

[164] This proportion is calculated as 1 minus the mean of the variable "NEWOUTCEO" divided by the mean of the variable "NEWCEO."

between the different measures related to compensation (TOTALGAP, CEOCOMP, TMTCOMP), and thirdly, between the two variables CEO age (CEOAGE) and retiring CEO (RETCEO). Particularly large is the correlation coefficient of TOTALGAP and CEOCOMP with a value of 0.95. Since the variables showing larger correlation coefficients are not used simultaneously within the regression models (except for CEOAGE and RETCEO), pairwise multicollinearity should not pose any serious problems. However, multicollinearity will be discussed in more detail in the context of robustness tests in Chapter 3.4.4.

In the following, a few selected correlations will be highlighted, which involve performance measures and/or compensation measures and are, therefore, of particular interest for this study.

Correlations of Compensation Measures and Firm Performance

TOTALGAP and CEOCOMP show significant and positive correlations with the performance measures ROE and ROA, while for MTB only the correlation with TOTALGAP is significant on at least a 10%-confidence level. TMTCOMP has a negative correlation with the performance measures ROE and ROA, which is significant on a 5%-confidence level for ROE. Yet, due to the transformation applied to TMTCOMP, a negative correlation indicates that the original average TMT compensation (excl. CEO) variable (before applying the transformation $1/\sqrt{x}$) shows a positive correlation with firm performance measured by ROE and ROA, too. For the performance measure MTB, the correlation with TMTCOMP is slightly positive, but not significant on at least a 10%-level.

These significant associations already provide some first support for *Hypotheses 1–3* that the compensation measures (CEOCOMP, TMTCOMP, and TOTALGAP) and firm performance might be positively linked, and indicate that higher compensation in general seems to go along with better firm performance.

Correlations of Compensation Measures and Control Variables

With regard to the other correlations, DUAL shows significant and positive correlations with TOTALGAP and CEOCOMP. This seems plausible when assuming that CEOs, who are, at the same time, chairmen of the board of directors, receive a higher compensation due to their dual mandate. Interestingly, the correlation between the level of top management team compensation (excl. the CEO), i.e. TMTCOMP, and DUAL (bearing in mind the variable transformation of TMTCOMP) also implies that in cases of CEO duality, average compensation levels of the rest of the TMT (excl. CEO) seem to be higher. Furthermore, there are significant and positive correlations between CEOAGE (as well as the closely related variable RETCEO) and the compensation measures TOTALGAP, CEOCOMP, and the underlying variable of TMTCOMP. Therefore, older CEOs seem to be awarded higher compensation sums and despite a simultaneous increase in TMT compensation, CEO compensation gaps increase as well. Firm size (SIZE) shows significant and positive correlations with TOTALGAP and CEOCOMP, while its negative correlation with the transformed variable TMTCOMP hints again at a positive correlation with the original variable. This indicates that larger firms tend to award higher compensation sums to their top executives and, simultaneously, install larger CEO compensation gaps.

The significant and positive correlation between TMTCOUNT and TOTALGAP is in accordance with the tournament theory prediction that a larger number of TMT members, who are assumed to engage in the tournament for promotion to the CEO position, leads to the installment of a larger CEO compensation gap, as this is necessary to keep up tournament incentives when the number of competitors increases.

The table depicts the Pearson correlation coefficients of the variables used in the quantitative regression models. The sample consists of 168 observations. The significance levels are denoted as follows: *p< 0.10, **p< 0.05, *** p< 0.01.

Variable	1	2	3	4	5	6	7
1 ROE	1.0000						
2 ROA	0.8357 ***	1.0000					
3 TOTALGAP	0.2847 ***	0.2330 ***	1.0000				
4 CEOCOMP	0.2672 ***	0.1959 **	0.9532 ***	1.0000			
5 TMTCOMP	-0.1909 **	-0.0799	-0.6914 ***	-0.8483 ***	1.0000		
6 SIZE	0.2408 ***	0.2757 ***	0.4007 ***	0.4337 ***	-0.3956 ***	1.0000	
7 DUAL	0.1305 *	0.0757	0.3344 ***	0.3444 ***	-0.1761 **	0.0603	1.0000
8 LEV	-0.1451 *	-0.3820 ***	-0.0736	-0.0166	-0.1205	0.0393	-0.1097
9 CEOAGE	-0.0134	0.0205	0.3226 ***	0.3045 ***	-0.2245 ***	0.0738	0.3474 ***
10 TMTCOUNT	0.0834	0.0891	0.3124 ***	0.2655 ***	-0.1047	0.4536 ***	-0.0302
11 RETCEO	-0.0338	-0.0752	0.1620 **	0.1807 **	-0.1392 **	-0.0560	0.3116 ***
12 NEWCEO	-0.0173	-0.0329	-0.0608	0.0362	-0.2131 ***	-0.0033	-0.0372
13 OUTCEO	0.0301	-0.0027	0.0404	0.0219	-0.0079	-0.0470	-0.1468 *
14 NEWOUTCEO	0.0107	-0.0133	-0.0638	-0.0162	-0.0747	-0.0832	-0.0039

Variable	8	9	10	11	12	13	14
8 LEV	1.0000						
9 CEOAGE	-0.1812 **	1.0000					
10 TMTCOUNT	-0.0785	0.1429 *	1.0000				
11 RETCEO	0.0053	0.5266 ***	-0.1205	1.0000			
12 NEWCEO	0.0705	-0.1048	-0.1360 *	0.0227	1.0000		
13 OUTCEO	0.1244	0.0479	-0.0594	0.1512 *	0.0208	1.0000	
14 NEWOUTCEO	0.0140	0.0793	-0.1137	0.1260	0.4895 ***	0.3812 ***	1.0000

Table 11: Correlation Matrix (Sample of ROE and ROA; 168 observations)

The table depicts the Pearson correlation coefficients of the variables used in the quantitative regression models. The sample consists of 166 observations. The significance levels are denoted as follows: *p< 0.10, **p< 0.05, *** p< 0.01.

Variable	1	2	3	4	5	6	7
1 ROE	1.0000						
2 ROA	0.8361 ***	1.0000					
3 MTB	0.3833 ***	0.3870 ***	1.0000				
4 TOTALGAP	0.2883 ***	0.2407 ***	0.1286 *	1.0000			
5 CEOCOMP	0.2695 ***	0.2013 ***	0.0749	0.9532 ***	1.0000		
6 TMTCOMP	-0.1905 **	-0.0792	0.0517	-0.6947 ***	-0.8505 ***	1.0000	
7 SIZE	0.2394 ***	0.2722 ***	0.0519	0.4086 ***	0.4396 ***	-0.3963 ***	1.0000
8 DUAL	0.1293 *	0.0728	0.0564	0.3396 ***	0.3481 ***	-0.1760 **	0.0577
9 LEV	-0.1419 *	-0.3759 ***	-0.3991 ***	-0.0894	-0.0273	-0.1245	0.0513
10 CEOAGE	-0.0079	0.0344	-0.1316 *	0.3142 ***	0.2997 ***	-0.2310 ***	0.0869
11 TMTCOUNT	0.0731	0.0326	0.0513	0.3263 ***	0.2909 ***	-0.1374 *	0.4487 ***
12 RETCEO	-0.0243	-0.0526	-0.1990 **	0.1422 *	0.1710 **	-0.1534 **	-0.0355
13 NEWCEO	-0.0189	-0.0368	-0.2045 ***	-0.0569	0.0393	-0.2130 ***	-0.0066
14 OUTCEO	0.0367	0.0114	-0.0481	0.0253	0.0109	-0.0103	-0.0355
15 NEWOUTCEO	0.0099	-0.0152	-0.0840	-0.0620	-0.0148	-0.0745	-0.0850

Variable	8	9	10	11	12	13	14	15
8 DUAL	1.0000							
9 LEV	-0.1041	1.0000						
10 CEOAGE	0.3610 ***	-0.2180 ***	1.0000					
11 TMTCOUNT	-0.0261	0.0676	0.0948	1.0000				
12 RETCEO	0.3490 ***	-0.0590	0.5039 ***	-0.1189	1.0000			
13 NEWCEO	-0.0395	0.0803	-0.0976	-0.1062	0.0430	1.0000		
14 OUTCEO	-0.1415 *	0.0956	0.0152	0.0019	0.0930	0.0308	1.0000	
15 NEWOUTCEO	-0.0050	0.0185	0.0850	-0.0975	0.1438 *	0.4891 ***	0.3929 ***	1.0000

Table 12: Correlation Matrix (Sample of MTB; 166 observations)

3.3 Inferential Statistics

The following chapter presents the results of the various regressions and moderated regressions that serve to test the hypotheses elaborated in Chapter 2.5.1. All regressions are performed with Stata.

3.3.1 CEO / TMT Compensation and Firm Performance

The variables CEO compensation (CEOCOMP) and average TMT compensation (TMTCOMP) form the basis for calculating CEO compensation gap. Their assumed association with firm performance is stated in *Hypotheses 1* and *2*.

H1 The higher the CEO compensation, the better the firm performance.

H2 The higher the average TMT compensation, the better the firm performance.

Using univariate and multiple regressions with ROE, ROA, and MTB as the dependent firm performance variables, the association of these compensation variables with firm performance is examined.

a) Univariate Regressions

The univariate regressions of ROE show significant associations for CEOCOMP on the 1%-significance level and for TMTCOMP on the 5%-significance level (cf. Table 13). For CEOCOMP, the regression coefficient is positive, while TMTCOMP shows a negative coefficient. However, due to the transformation of the original TMT compensation variable, the negative coefficient of TMTCOMP also implies a positive association with the performance variable (cf. Chapter 3.2.2 for the transformation performed). For ROA as the dependent firm performance variable, the associations are weaker, but CEOCOMP still shows a positive regression coefficient which is significant on the 5%-level. Furthermore, the goodness of fit of the models has to be considered. This is reflected in the coefficients of determination (R^2 values) of each model, indicating the proportion of variance explained by the model. The highest R^2 of 7.1% results for the regression of ROE on CEOCOMP. For the other univariate regressions, the coefficient of determination, R^2, is below 4%. The regressions of

MTB did not produce any significant results and are, therefore, not presented in detail in this chapter (cf. App. 1).[165]

The table reports univariate OLS regressions of ROE and ROA on CEOCOMP and TMTCOMP. Values of the t-statistics are based on heteroscedasticity robust standard errors and are reported in parentheses. The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable			
	ROE		ROA	
	CEOCOMP	TMTCOMP	CEOCOMP	TMTCOMP
Intercept	-0.8677 ***	0.2979 ***	-0.2891 *	0.1017 ***
	(-2.67)	(4.67)	(-1.87)	(3.74)
CEOCOMP	0.0673 ***		0.0238 **	
	(3.21)		(2.40)	
TMTCOMP		-176.0855 **		-35.5239
		(-2.10)		(-0.92)
R^2	0.0714	0.0365	0.0384	0.0064
F-statistic	10.29 ***	4.43 **	5.77 **	0.85
Observations (N)	168	168	168	168

Table 13: Univariate Regressions of ROE and ROA on CEOCOMP and TMTCOMP

Overall, the univariate regressions already provide some support for a positive association of CEO and TMT compensation with firm performance. Table 14 summarizes the results.

> **Conclusion:** The univariate regressions provide evidence for a significant and positive association between CEO compensation and firm performance measured as ROE and ROA. The average TMT compensation variable (without transformation) shows a significant and positive association with ROE. No evidence could be found in univariate regressions for an association of MTB with the compensation variables CEOCOMP and TMTCOMP.

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[165] Still, MTB will be used as variable of interest in multiple regressions, too, since it might turn out to be a valuable predictor variable in combination with other variables.

The table summarizes the results of the univariate OLS regressions of firm performance on CEOCOMP and TMTCOMP. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association.

	Dependent Variable		
Variable of Interest	ROE	ROA	MTB
H1 CEOCOMP	+	+	0
H2 TMTCOMP	+	0	0

Table 14: Results of Univariate Regressions on CEOCOMP and TMTCOMP

b) Multiple Regressions

The multiple regressions of ROE and MTB show significant coefficients for both compensation variables CEOCOMP and TMTCOMP, while for the regressions of ROA only the regression on CEOCOMP yields a significant coefficient.[166] All coefficients again indicate a positive association of CEO compensation and average TMT compensation (despite the negative regression coefficients for TMTCOMP which are due to the variable transformation applied) with firm performance measured by ROE, ROA and MTB.

The control variables add to the explanatory power of the models, leading to a strong increase in R^2 compared to the univariate regression models. However, most control variables are not significant, with the exception of leverage (LEV) in the regressions of ROA which shows highly significant negative correlation coefficients at the 1%-significance level, and firm size (SIZE) which is significant at a 5%-level in the regression of ROA on TMTCOMP and in the regression of MTB on CEOCOMP.

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[166] However, this significance is lost when compounding a regression model that contains only significant variables (not shown).

In the regression of ROA on CEOCOMP, SIZE is significant at the 10%-level. All models are highly significant at a 1%-level as indicated by the F-statistics.[167]

Compared to the regressions of ROE and ROA, the regressions of MTB yield a notably higher R^2 of almost 60%. This underlines the findings of a positive association between CEO compensation and firm performance, as well as between TMT compensation and firm performance. Table 15 provides an overview of significant results and the direction of their signs, while the detailed regression results of the multiple regressions are shown in Table 16.

Conclusion: Both CEO compensation and average TMT compensation (excl. CEO) show a significant and positive association with firm performance measured as ROE and MTB. CEO compensation also shows a significant and positive association with firm performance measured as ROA. However, this significance is lost in the "significant variables only" regressions.

The table summarizes the results of the multiple regressions on CEOCOMP and TMTCOMP. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association. ° designates the results that lose significance when tested in a model containing only significant variables.

Variable of Interest	Dependent Variable		
	ROE	ROA	MTB
H1 CEOCOMP	+	+°	+
H2 TMTCOMP	+	0	+

Table 15: Results of Multiple Regressions on CEOCOMP and TMTCOMP

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[167] The F-statistic takes into account both the analysis of variance and the sample size. It indicates whether the regression results are expected to be valid for the population, beyond the available sample (Backhaus et al., 2000: 24–25).

The table shows the results of the multiple OLS regressions of ROE, ROA and MTB on CEOCOMP and TMTCOMP. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. The regressions contain year and industry dummies (not shown). The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: ROE		Dependent Variable: ROA		Dependent Variable: MTB	
	CEOCOMP	TMTCOMP	CEOCOMP	TMTCOMP	CEOCOMP	TMTCOMP
Intercept	-0.7756 **	0.5704 **	-0.0834	0.1313	-0.8383	2.4232 ***
	(-2.01)	(2.18)	(-0.69)	(1.32)	(-0.87)	(3.31)
CEOCOMP	0.0853 **		0.0178 *		0.2094 **	
	(2.58)		(1.89)		(2.62)	
TMTCOMP		-222.0198 *		-13.8623		-503.9669 *
		(-1.95)		(-0.43)		(-1.72)
SIZE	0.0157	0.0230	0.0189 *	0.0232 **	-0.0886 **	-0.0678
	(0.69)	(0.97)	(1.70)	(2.00)	(-2.19)	(-1.56)
DUAL	-0.0083	0.0187	-0.0171	-0.0099	-0.0316	0.0431
	(-0.19)	(0.47)	(-1.22)	(-0.75)	(-0.25)	(0.36)
LEV	-0.1548	-0.1830	-0.1888 ***	-0.1920 ***	0.3365	0.2582
	(-1.02)	(-1.18)	(-3.53)	(-3.50)	(1.18)	(0.90)
CEOAGE	-0.0029	-0.0017	-0.0012	-0.0007	-0.0059	-0.0035
	(-1.38)	(-0.88)	(-1.17)	(-0.79)	(-0.83)	(-0.50)
TMTCOUNT	-0.0408	-0.0267	-.0243	-0.0224	-0.0984	-0.0602
	(-1.11)	(-0.73)	(-1.32)	(-1.21)	(-1.02)	(-0.59)
R^2	0.2277	0.2136	0.2903	0.2827	0.5838	0.5754
F-statistic	7.68 ***	6.90 ***	15.14 ***	15.58 ***	20.50 ***	18.60 ***
Observations (N)	168	168	168	168	166	166
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

Table 16: Multiple Regressions on CEOCOMP and TMTCOMP

3.3.2 CEO Compensation Gap and Firm Performance

The analyses in this chapter are conducted to provide empirical evidence with respect to *Hypothesis 3* which postulates a positive link between the dependent variable firm performance and the independent variable CEO compensation gap:

> *H3 The larger the CEO compensation gap, the better the firm performance.*

In this respect, both a) univariate and b) multiple regressions are performed.

a) *Univariate Regressions*

Table 17 presents the OLS regression statistics for the univariate regressions of the performance measures ROE and ROA on the CEO compensation gap measures, i.e. total CEO compensation gap (TOTALGAP), long-term CEO compensation gap (LTGAP) and short-term CEO compensation gap (STGAP).

The univariate regressions show that both TOTALGAP and LTGAP are significant predictors of firm performance (at a 1%-significance level) when firm performance is measured as ROE and ROA. STGAP shows a significant association in the regression of ROE (at a 5%-significance level), but not in the regression of ROA. Furthermore, TOTALGAP and LTGAP explain a notable proportion of firm performance measured as ROE with an R^2 of 8.1% and 7.4% respectively.

In the univariate regressions of MTB, only TOTALGAP shows a significant regression coefficient (at a 10%-significance level); however, the R^2 of all regressions (TOTALGAP, LTGAP and STGAP) are below 2%. Due to the few significant coefficients and the low levels of explained variance, the results are displayed in the Appendix (cf. App. 2).

The table reports univariate OLS regressions of ROE and ROA on TOTALGAP, LTGAP and STGAP. Values of the t-statistics are based on heteroscedasticity robust standard errors and are reported in parentheses. The significance levels are denoted as follows: $*p < 0.10$, $** p < 0.05$, $***p < 0.01$.

	Dependent Variable					
	ROE			ROA		
Independent Variables	TOTALGAP	LTGAP	STGAP	TOTALGAP	LTGAP	STGAP
Intercept	-0.6046 ***	-0.3253 **	-0.4882 *	-0.2275 **	-0.1249 *	-0.1353
	(-2.89)	(-2.06)	(-1.66)	(-2.26)	(-1.81)	(-0.85)
TOTALGAP	0.0523 ***			0.0206 ***		
	(3.74)			(3.10)		
LTGAP		0.0358 ***			0.0145 ***	
		(3.17)			(3.02)	
STGAP			0.0459 **			0.0148
			(2.23)			(1.32)
R^2	0.0810	0.0742	0.0485	0.0543	0.0511	0.0224
F-statistic	13.99 ***	10.08 ***	4.95 **	9.61 ***	9.14 ***	1.75
Observations (N)	168	131	141	168	131	141

Table 17: Univariate Regressions on TOTALGAP, LTGAP and STGAP

What can be inferred from these results? The positive signs of the regression coefficients of the different compensation gap measures are in line with tournament theory predictions. In other words, larger compensation gaps are associated with better firm performance. Furthermore, the results for the t-statistics show that the association between CEO compensation gaps and firm performance is on average stronger for compensation measures including long-term compensation components (TOTALGAP and LTGAP) and weaker for short-term compensation gap measures. Altogether, these regression results already provide some first support for *Hypothesis 3*. Table 18 gives an overview of the univariate OLS regression results of this subchapter.

The table summarizes the results of the univariate regressions of firm performance on TOTALGAP, LTGAP and STGAP. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association.

	Dependent Variable		
Variable of Interest	ROE	ROA	MTB
TOTALGAP	+	+	+
LTGAP	+	+	0
STGAP	+	0	0

Table 18: Results of Univariate Regressions on TOTALGAP, LTGAP and STGAP

Conclusion: CEO compensation gap tends to be positively associated with firm performance in univariate regressions. The variable TOTALGAP yields the most significant results, while results for regressions on LTGAP are still stronger than for regressions on STGAP.

b) Multiple Regressions

Table 20, Table 21 and Table 22 show the regression results of the multiple regressions of ROE, ROA and MTB on the various CEO compensation gap measures. The regressions on total CEO compensation gap clearly support *Hypothesis 3* as they show significant and positive associations of compensation gap and firm performance. The regression coefficients of total CEO compensation gap (TOTALGAP) are significant at a 1%-level in the regression of ROE (cf. Table 20) and at a 5%-level in the regressions of ROA and MTB (cf. Table 21 and Table 22).

When considering long-term CEO compensation gap (LTGAP) and short-term CEO compensation gap (STGAP), these results mostly remain valid. For the regressions with ROE as the dependent variable, LTGAP shows a positive regression coefficient

which is significant at the 5%-confidence level, while STGAP shows a positive regression coefficient which is significant at the 10%-level.[168]

The regressions of ROA show a positive coefficient at a 10%-significance level for the regression on LTGAP, while the coefficient of STGAP is not significant. Nevertheless, the coefficient of STGAP becomes significant at a 10%-level when compounding a regression model with significant variables only (cf. App. 4). With regard to MTB, again the strongest results in terms of significance are achieved in the regressions on TOTALGAP and LTGAP which yield significant and positive coefficients at a 5%-significance level. When compounding a "significant variables only" model, the required significance level of 10% is slightly missed for LTGAP. The regressions of MTB do not yield significant results for the coefficient of STGAP (cf. Table 22 and App. 5).[169]

However, besides the regression coefficients and the respective t-statistics, also the goodness of fit of the models has to be considered. The R^2 for the regression models of ROE range from 22.5% to 26.5%. For the regression models of ROA, the R^2 varies between 29.6% and 34.2% which are relatively large values.[170] The regression models of MTB show an R^2 between 58.0% and 61.8%. While frequently having yielded insignificant results and minimal R^2 when compensation gap was used as a single predictor variable of MTB, multiple regressions of MTB on compensation gap measures and other independent variables unveil the explanatory power of such regression models containing CEO compensation gap: They produce notably higher R^2 than the regressions of ROE and ROA. This hints at the fact that MTB does not seem to be a powerful predictor variable when considered all by itself, but demonstrates its power when other important predictor variables are added to the

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[168] Exemplified regression models which only contain significant variables are illustrated for these regressions in App. 3. However, the additional analyses do not impact results in the case of ROE.

[169] As for the regressions on different compensation gap measures (TOTALGAP, LTGAP and STGAP), the compilation of "significant variables only" regression models had a larger impact on results than for the other regression analyses performed in this dissertation, the results of these "significant variables only" regression models are illustrated in the appendix for the calculations of this chapter.

[170] For comparison, the R^2 in Henderson and Fredrickson's (2001) study of the performance effects of long-term compensation gap was 21% to 22%.

regression model. As the latter also more realistically reflects underlying interdependencies, less significant univariate regressions can be more easily tolerated.

In this study, the R^2 values calculated for regressions with ROA as the dependent variable indicate a slightly better goodness of fit than the R^2 of the models with ROE as the dependent variable. This can possibly be traced to the fact that the models for the dependent variable ROA show more significant regression coefficients than the models with ROE as the firm performance measure. Therefore, the other significant regression coefficients, besides the compensation gap measures, are discussed in the following.

In the regressions of ROE on the independent variables, there are only few significant variables except for the compensation gap variables which have already been highlighted before. In the full regressions on total compensation gap (TOTALGAP), long-term compensation gap (LTGAP), and short-term compensation gap (STGAP), the compensation gap variables show the only significant regression coefficients.

In the regressions with ROA as the dependent variable, firm size (SIZE) shows positive regression coefficients for all OLS regressions, with a significant coefficient for the regression on total compensation gap (TOTALGAP). CEO duality (DUAL) shows significant and negative regression coefficients for the regressions on long-term CEO compensation gap (LTGAP) and on short-term CEO compensation gap (STGAP). For the regression of ROA on total CEO compensation gap, a negative regression coefficient is obtained for the variable DUAL, too. This indicates that in cases of CEO duality, firm performance tends to be lower.

In the regressions of MTB, firm size (SIZE) yields significant and negative coefficients in the regressions on TOTALGAP and LTGAP at a 10%-significance level. Thus, the direction of influence is contrary to the regressions of ROA. However, this is not a large issue since ROA and MTB are relatively different firm performance measures, as is already indicated by their rather moderate positive coefficient of correlation (cf. Table 12 in Chapter 3.2.3).

Comparing the different CEO compensation gap measures (TOTALGAP, LTGAP and STGAP), it can be observed that differentiating total CEO compensation gap (TOTALGAP) into long-term gap and short-term gap yields less significant results than using total CEO compensation gap, even though results for LTGAP and STGAP tend to gain significance in the regressions of ROA when compiling regression models which contain significant variables only. However, for MTB, significance is lost when regressing MTB on LTGAP based on a regression model which contains only significant variables.

The explanatory power of these models with LTGAP and STGAP as the variables of interest tends to increase compared to the operationalization with TOTALGAP as compensation gap measure. Interestingly, for the regressions of ROE and ROA, especially the models with STGAP yield the highest R^2.

Thus, the results only partly confirm the rationale for differentiating between TOTALGAP, LTGAP and STGAP. Thus, differentiation of TOTALGAP into LTGAP and STGAP is not necessary for this sample to strengthen the significance of results.[171] The variable TOTALGAP does not only constitute the most comprehensive gap measure, but also generates the strongest results in terms of significance levels for the variable of interest (CEO compensation gap).

Table 19 gives an overview of the regression results for the different operationalizations of CEO compensation gap. Overall, the results clearly support *Hypothesis 3* that CEO compensation gap is positively associated with firm performance, measured by ROE, ROA, and MTB.

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[171] Focusing on long-term compensation disparity was proposed by Henderson & Fredrickson (2001: 107) to generate stronger results, compare Chapter 3.1.1.

The table summarizes the results of the multiple regressions on TOTALGAP, LTGAP and STGAP.
+ denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association. * designates that the result becomes significant and positive when tested in a model containing only significant variables.
° indicates that the result of the regression containing only significant variables slightly missed the required significance level.

	Dependent Variable		
Variable	ROE	ROA	MTB
TOTALGAP	+	+	+
LTGAP	+	+	+°
STGAP	+	0*	0

Table 19: Results of Multiple Regressions on TOTALGAP, LTGAP and STGAP

Conclusion: The multiple regression results provide evidence for a positive association between CEO compensation gap and firm performance measured as ROE, ROA, and MTB. Overall, regressions on total CEO compensation gap yield the strongest results with respect to significance levels of regression coefficients for the variable of interest (CEO compensation gap), compared to long-term and short-term CEO compensation gap.

The table shows the results of multiple OLS regressions of ROE on TOTALGAP, LTGAP and STGAP. The regressions contain heteroscedasticity robust standard errors.
The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: ROE		
	TOTALGAP	LTGAP	STGAP
Intercept	-0.3556	0.0130	-0.1605
	(-1.65)	(0.07)	(-0.60)
TOTALGAP	0.0562 ***		
	(2.96)		
LTGAP		0.0343 **	
		(2.47)	
STGAP			0.0448 *
			(1.96)
SIZE	0.0218	0.0345	0.0301
	(1.00)	(1.31)	(1.39)
DUAL	0.0010	-0.0495	-0.0552
	(0.02)	(-0.97)	(-1.52)
LEV	-0.1507	-0.2353	-0.1724
	(-0.99)	(-1.27)	(-1.11)
CEOAGE	-0.0031	-0.0040	-0.0038
	(-1.44)	(-1.61)	(-1.39)
TMTCOUNT	-0.0451	-0.0410	-0.0354
	(-1.24)	(-0.97)	(-0.72)
R^2	0.2248	0.2603	0.2649
F-statistic	8.11 ***	9.22 ***	10.44 ***
Observations (N)	168	131	141
Year dummies	yes	yes	yes
Industry dummies	yes	yes	yes

Table 20: Multiple Regressions of ROE on TOTALGAP, LTGAP and STGAP

The table shows the results of multiple OLS regressions of ROA on TOTALGAP, LTGAP and STGAP. The regressions contain heteroscedasticity robust standard errors.
The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: ROA		
	TOTALGAP	LTGAP	STGAP
Intercept	-0.0300	0.0957	0.0390
	(-0.33)	(1.08)	(0.32)
TOTALGAP	0.0157 **		
	(2.26)		
LTGAP		0.0107 *	
		(1.75)	
STGAP			0.0163
			(1.49)
SIZE	0.0188 *	0.0172	0.0175
	(1.71)	(1.16)	(1.60)
DUAL	-0.0172	-0.0383 *	-0.0314 *
	(-1.19)	(-1.92)	(-1.98)
LEV	-0.1869 ***	-0.2228 ***	-0.2362 ***
	(-3.53)	(-3.02)	(-3.21)
CEOAGE	-0.0014	-0.0015	-0.0019
	(-1.35)	(-1.17)	(-1.49)
TMTCOUNT	-0.0260	-0.0168	-0.0172
	(-1.43)	(-0.89)	(-0.85)
R^2	0.2959	0.3166	0.3420
F-statistic	15.67 ***	12.06 ***	16.70 ***
Observations (N)	168	131	141
Year dummies	yes	yes	yes
Industry dummies	yes	yes	yes

Table 21: Multiple Regressions of ROA on TOTALGAP, LTGAP and STGAP

The table shows the results of multiple OLS regressions of MTB on TOTALGAP, LTGAP and STGAP. The regressions contain heteroscedasticity robust standard errors.
The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: MTB		
	TOTALGAP	LTGAP	STGAP
Intercept	0.2755	0.5156	0.7804
	(0.45)	(0.92)	(1.14)
TOTALGAP	0.1269 **		
	(2.41)		
LTGAP		0.1173 **	
		(2.55)	
STGAP			0.0658
			(1.09)
SIZE	-0.0698 *	-0.0799 *	-0.0418
	(-1.88)	(-1.98)	(-0.99)
DUAL	-0.0050	-0.1679	-0.0099
	(-0.04)	(-0.86)	(-0.07)
LEV	0.3473	0.4631	0.3232
	(1.21)	(1.51)	(0.94)
CEOAGE	-0.0058	-0.0046	-0.0040
	(-0.78)	(-0.61)	(-0.53)
VPNUMBER	-0.1083	-0.0866	-0.0476
	(-1.16)	(-0.74)	(-0.35)
R^2	0.5796	0.6178	0.5911
F-statistic	19.83 ***	21.93 ***	18.33 ***
Observations (N)	166	131	139
Year dummies	yes	yes	yes
Industry dummies	yes	yes	yes

Table 22: Multiple Regressions of MTB on TOTALGAP, LTGAP and STGAP

3.3.3 Moderated Relationships

In this chapter, moderated multiple regressions are performed to empirically test *Hypotheses 4–6* (cf. Chapter 2.5.1). The results of the moderated regressions are presented for the regressions on TOTALGAP, since the variable TOTALGAP delivered the strongest results for the general relationship stipulated in *Hypothesis 3* regarding the positive relationship between CEO compensation gap and firm performance, throughout all regressions performed above. Furthermore, TOTALGAP is a comprehensive measure, incorporating influences of both LTGAP and STGAP, and in the end, it is total compensation which should ideally be linked with performance.

Subchapter a) presents the moderated OLS regressions of ROE, followed by Subchapter b), which depicts the moderated OLS regressions of ROA, and Subchapter c) with the moderated OLS regressions of market-to-book (MTB).

a) *Regressions of ROE*

Table 23 shows the results of the moderated regressions of ROE. Two moderating terms show significant effects: TOTALGAP*NEWOUTCEO shows a significant and positive regression coefficient, while TOTALGAP*DUAL displays a significant and negative regression coefficient. The significance level of both moderating terms is 1%. For the other moderating variables, the coefficients of the moderating terms are not significant.

The table shows the OLS regressions of ROE on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year and industry dummies (not shown). The significance levels are denoted as follows: $*p < 0.10$, $** p < 0.05$, $***p < 0.01$.

Independent Variables	Dependent Variable: ROE					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	-0.3556	-0.3675	-0.3997	-0.2159	-0.3023	-0.6373 **
	(-1.65)	(-1.55)	(-1.50)	(-0.90)	(1.41)	(-2.44)
TOTALGAP	0.0562 ***	0.0599 ***	0.0594 ***	0.0488 **	0.0474 **	0.0722 ***
	(2.96)	(3.11)	(2.65)	(2.50)	(2.49)	(3.51)
SIZE	0.0218	0.0222	0.0203	0.0221	0.0270	0.0252
	(1.00)	(1.00)	(0.91)	(1.01)	(1.23)	(1.17)
DUAL	0.0010	-0.0042	-0.0015	0.0170	-0.0114	1.4829 ***
	(0.02)	(-0.11)	(-0.03)	(0.35)	(-0.35)	(3.29)
LEV	-0.1507	-0.1617	-0.1468	-0.1612	-0.1138	-0.1750
	(-0.99)	(-1.05)	(-1.01)	(-0.96)	(-0.89)	(-1.16)
CEOAGE	-0.0031	-0.0038	-0.0030	-0.0039 *	-0.0029	-0.0026
	(-1.44)	(-1.41)	(-1.24)	(-1.78)	(-1.30)	(-1.21)
TMTCOUNT	-0.0451	-0.0448	-0.0441	-0.0430	-0.0435	-0.0565
	(-1.24)	(-1.20)	(-1.20)	(-1.19)	(-1.21)	(-1.53)
Moderating Factors						
H2: RETCEO		0.6572				
		(1.10)				
TOTALGAP*RETCEO		-0.0417				
		(-1.06)				
H3: NEWCEO			0.1668			
			(0.33)			
TOTALGAP*NEWCEO			-0.0097			
			(-0.27)			
H4: OUTCEO				-0.4902		
				(-0.74)		
TOTALGAP*OUTCEO				0.0361		
				(0.82)		
H5: NEWOUTCEO					-3.2914 ***	
					(-2.70)	
TOTALGAP*NEWOUTCEO					0.2361 ***	
					(2.71)	
H6: TOTALGAP*DUAL						-0.0967 ***
						(-3.31)
R^2	0.2248	0.2282	0.2273	0.2354	0.2755	0.2532
F-statistic	8.11 ***	7.71 ***	7.67 ***	7.75 ***	8.34 ***	11.15 ***
Observations (N)	168	168	168	168	168	168
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

Table 23: Multiple Moderated Regressions of ROE

However, the overall effect of TOTALGAP on the dependent variable (i.e. firm performance measured as ROE in this case) is not obvious based on the regression coefficients of the variable of interest and the moderating variable alone. This is highlighted by Brambor et al. (2006: 73) who note in this regard that *"the additive model asserts that X has a constant effect on Y, while the interaction* [i.e. moderation] *model asserts that the effect of a change in X on Y depends on the value of the conditioning variable Z."*

Therefore, to illustrate the marginal effect of TOTALGAP on ROE depending on the value of the moderating variable, additional calculations are performed for the relevant value range of the two variables which are contained in the significant moderating terms.[172]

As all the moderating variables with significant regression coefficients in the OLS regressions of ROE are dummy variables, the marginal effects are calculated for the two possible values which the moderating variable can take, i.e. "0" and "1." The formula for the marginal effect is the derivative of the regression formula (cf. Chapter 3.1.3) which renders

$$\partial \text{ROE} \, / \, \partial \text{TOTALGAP} = \beta_1 + \beta_2 * Z$$

where β_1 is the regression coefficient of TOTALGAP, β_2 is the regression coefficient of the moderating term and Z labels the moderating variable (in this case, NEWOUTCEO and DUAL with the values "0" and "1").

Table 24 displays the results of these calculations for the moderating variables NEWOUTCEO and DUAL. Furthermore, the 90%-confidence intervals for the values "0" and "1" of the moderating variable are indicated.

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[172] This approach is proposed by Brambor et al. (2006: 74). However, it has to be noted that in order to calculate unbiased marginal effects, all significant moderators would have to be considered simultaneously, which would notably increase the complexity of calculations, while the results might still be distorted due to the missing moderators not yet identified as significant. Consequently, the marginal effect calculations above are presented rather for the purpose of completeness.

Dependent Variable: ROE	Moderating Variable	
	NEWOUTCEO	DUAL
Marginal effect (Z=0)	0.0474	0.0722
Marginal effect (Z=1)	0.2835	-0.0245
Confidence interval, min. (Z=0)	0.0450	0.0696
Confidence interval, max. (Z=0)	0.0498	0.0748
Confidence interval, min. (Z=1)	0.2727	-0.0278
Confidence interval, max. (Z=1)	0.2942	-0.0213

Table 24: Marginal Effects of TOTALGAP on ROE

The values for the marginal effects as well as their confidence intervals show two different kinds of interdependencies for the moderating variables NEWOUTCEO and DUAL: For NEWOUTCEO, the marginal effects for Z=0 and Z=1 are both positive, while the marginal effect of Z=1 is greater than for Z=0. This indicates a reinforcing effect of the moderating variable NEWOUTCEO on the already positive association of CEO compensation gap with firm performance, which means that TOTALGAP seems to have a stronger association with firm performance, measured as ROE, in years when a new CEO has been hired from outside the firm. This is contrary to *Hypothesis 5c* which predicts a lower association.

For the moderator DUAL, only the marginal effect for Z=0 is positive. In case of Z=1, meaning when CEO duality is present, the marginal effect is negative. This supports *Hypothesis 6* which states that in the presence of CEO duality, TOTALGAP and firm performance are less positively related.

The confidence intervals further support the significance of these findings. To have a significant relationship, each confidence interval must not include the value "0," implying that it has to be situated completely above or below "0" (Brambor et al., 2006: 76). While the confidence intervals for NEWOUTCEO both lie above "0," the confidence interval for DUAL=0 is completely above "0" and for DUAL=1

completely below "0." Consequently, none of the confidence intervals includes the value "0," indicating that the significance of results is given.

Table 25 summarizes the results of the multiple moderated regressions of ROE.

The table summarizes the results of the multiple moderated OLS regressions of ROE. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association.

Hypothesis	Variables/Moderating Terms	Result
H3	TOTALGAP	+
H4	TOTALGAP*RETCEO	0
H5a	TOTALGAP*NEWCEO	0
H5b	TOTALGAP*OUTCEO	0
H5c	TOTALGAP*NEWOUTCEO	+
H6	TOTALGAP*DUAL	-

Table 25: Results of Multiple Moderated Regressions of ROE

Conclusion: The following significant moderating effects with regard to the correlation between TOTALGAP and ROE are found: NEWOUTCEO shows a positive moderating effect and DUAL a negative moderating effect.

b) Regressions of ROA

Table 26 presents the results of the moderated regressions of ROA. These regressions yield three significant moderating variables: RETCEO, NEWOUTCEO and DUAL. Two of them, i.e. NEWOUTCEO and DUAL, were already significant in the regressions of ROE. The moderating term TOTALGAP*RETCEO shows a negative regression coefficient which is significant at the 10%-level.[173]

As for ROE, the moderating term for TOTALGAP*NEWOUTCEO shows a positive regression coefficient and the moderating term TOTALGAP*DUAL a negative coefficient. However, in the regressions of ROA, the coefficients of both variables display a lower significance level: NEWOUTCEO is significant at the 10%-level; DUAL, at the 5%-level. The moderating terms of the other variables do not show any significant coefficients.

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[173] Nevertheless, it has to be noted that the significance of this interaction term is slightly lost when compounding a "significant variables only" model. In that case, TOTALGAP*RETCEO reaches a probability $p > |t|$ of 12.6%.

The table shows the OLS regressions of ROA on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year and industry dummies (not shown). The significance levels are denoted as follows: *$p < 0.10$, ** $p < 0.05$, ***$p < 0.01$.

Independent Variables	Dependent Variable: ROA					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	-0.0300	-0.0664	-0.0641	-0.0169	-0.0176	-0.1181
	(-0.33)	(-0.66)	(-0.58)	(-0.17)	(-0.20)	(-1.15)
TOTALGAP	0.0157 **	0.0182 **	0.0190 **	0.0150 *	0.0137 *	0.0207 ***
	(2.26)	(2.58)	(2.20)	(1.97)	(1.94)	(2.90)
SIZE	0.0188 *	0.0194 *	0.0186 *	0.0191 *	0.0200 *	0.0198 *
	(1.71)	(1.74)	(1.68)	(1.70)	(1.80)	(1.79)
DUAL	-0.0172	-0.0168	-0.0198	-0.0126	-0.0201	0.4460 **
	(-1.19)	(-1.27)	(-1.28)	(-0.76)	(-1.45)	(2.45)
LEV	-0.1869 ***	-0.1940 ***	-0.1903 ***	-0.1969 ***	-0.1786 ***	-0.1945 ***
	(-3.53)	(-3.50)	(-3.44)	(-3.31)	(-3.32)	(-3.61)
CEOAGE	-0.0014	-0.0014	-0.0015	-0.0016	-0.0013	-0.0012
	(-1.35)	(-1.14)	(-1.39)	(-1.49)	(-1.28)	(-1.20)
TMTCOUNT	-0.0260	-0.0280	-0.0265	-0.0249	-0.0255	-0.0295
	(-1.43)	(-1.50)	(-1.44)	(-1.41)	(-1.41)	(-1.62)
Moderating Factors						
H2: RETCEO		0.4518 *				
		(1.70)				
TOTALGAP*RETCEO		-0.0304 *				
		(-1.76)				
H3: NEWCEO			0.2005			
			(1.12)			
TOTALGAP*NEWCEO			-0.0138			
			(-1.10)			
H4: OUTCEO				0.0294		
				(0.11)		
TOTALGAP*OUTCEO				-0.0009		
				(-0.5)		
H5: NEWOUTCEO					-0.7565 *	
					(-1.75)	
TOTALGAP*NEWOUTCEO					0.0545 *	
					(1.73)	
H6: TOTALGAP*DUAL						-0.0302 **
						(-2.59)
R^2	0.2959	0.3038	0.2991	0.3005	0.3080	0.3078
F-statistic	15.67 ***	13.18 ***	13.74 ***	13.10 ***	14.42 ***	13.31 ***
Observations (N)	168	168	168	168	168	168
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

Table 26: Multiple Moderated Regressions of ROA

To illustrate the marginal effect of TOTALGAP on ROA when significant moderating variables are present, the same calculation procedure as already applied for the marginal effects on ROE is used again. The results are displayed in Table 27. For NEWOUTCEO and DUAL, the picture is very much the same as for the marginal effects on ROE. The presence of a new CEO hired from outside the firm (NEWOUTCEO=1) has a reinforcing effect on the already positive relationship between TOTALGAP and ROA, while the presence of CEO duality (DUAL=1) has a reducing effect on this association, even leading to a negative marginal effect of TOTALGAP on ROA. Therefore, the findings for NEWOUTCEO contradict Hypothesis 5c, while the findings for DUAL corroborate Hypothesis 6.

The moderating variable RETCEO has a comparable effect to the variable DUAL. The calculations for the marginal effect show that in the presence of a retiring CEO, the marginal effect of TOTALGAP on ROA is negative, while the marginal effect for RETCEO=0 is larger than "0." Here again, the 90%-confidence interval for RETCEO=0 is located completely above "0," while the confidence interval for RETCEO=1 is situated entirely below "0," underlining the significance of the calculated marginal effects.

Dependent Variable: ROA	Moderating Variable		
	RETCEO	NEWOUTCEO	DUAL
Marginal effect (Z=0)	0.0182	0.0137	0.0207
Marginal effect (Z=1)	-0.0122	0.0681	-0.0095
Confidence interval, min. (Z=0)	0.0173	0.0128	0.0198
Confidence interval, max. (Z=0)	0.0191	0.0146	0.0216
Confidence interval, min. (Z=1)	-0.0143	0.0642	-0.0110
Confidence interval, max. (Z=1)	-0.0100	0.0720	-0.0081

Table 27: Marginal Effects of TOTALGAP on ROA

Table 28 summarizes the results of the moderated OLS regressions of ROA, indicating the direction of the moderating effect for significant moderating terms.

The table summarizes the results of the multiple moderated OLS regressions of ROA.
+ denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association. ° indicates that the result slightly missed the required significance level in a regression model containing only significant variables.

Hypothesis	Variables/Moderating Terms	Result
H3	TOTALGAP	+
H4	TOTALGAP*RETCEO	-°
H5a	TOTALGAP*NEWCEO	0
H5b	TOTALGAP*OUTCEO	0
H5c	TOTALGAP*NEWOUTCEO	+
H6	TOTALGAP*DUAL	-

Table 28: Results of Multiple Moderated Regressions of ROA

Conclusion: The following significant moderating effects with regard to the relationship between TOTALGAP and ROA are found: NEWOUTCEO shows a positive moderating effect, while RETCEO and DUAL show negative moderating effects.

c) Regressions of MTB

In the following, market-to-book ratio (MTB) as a third performance variable is employed as dependent variable in the regressions. This also serves to further strengthen the robustness of results. The results of the moderated OLS regressions of MTB are illustrated in Table 29.

The moderating term in the moderated OLS regressions yields a significant and positive coefficient for TOTALGAP*OUTCEO, and a significant and negative coefficient for TOTALGAP*DUAL, both at a 1%-significance level. R^2 for these regressions is constantly above 57% and, thus, considerably larger than for the respective regressions of ROE and ROA.

The table shows the OLS regressions of MTB on TOTALGAP and the moderating and control variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year and industry dummies (not shown). The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
			Dependent Variable: MTB			
Intercept	0.2755	0.2362	0.2815	0.8688	0.2885	-0.6745
	(0.45)	(0.37)	(0.41)	(1.38)	(0.47)	(-1.02)
TOTALGAP	0.1269 **	0.1234 **	0.1297 **	0.0958 *	0.1240 **	0.1802 ***
	(2.41)	(2.25)	(2.31)	(1.86)	(2.29)	(3.21)
SIZE	-0.0698 *	0.0692	-0.0643 *	-0.0775 **	-0.0697 *	-0.0584
	(-1.88)	(-1.82) *	(-1.74)	(-2.19)	(-1.89)	(-1.58)
DUAL	-0.0050	0.0121	-0.0091	-0.0223	-0.0097	4.8682 ***
	(-0.04)	(0.09)	(-0.07)	(-0.19)	(-0.08)	(2.77)
LEV	0.3473	0.3510	0.3156	0.5501 *	0.3739	0.2731
	(1.21)	(1.20)	(1.10)	(1.90)	(1.23)	(1.00)
CEOAGE	-0.0058	-0.0044	-0.0070	-0.0067	-0.0055	-0.0038
	(-0.78)	(-0.52)	(-0.89)	(-0.90)	(-0.74)	(-0.51)
VPNUMBER	-0.1083	-0.1120	-0.1164	-0.1249	-0.1111	-0.1481
	(-1.16)	(-1.18)	(-1.25)	(-1.36)	(-1.17)	(-1.62)
Moderating Factors						
H2: RETCEO		-0.4894				
		(-0.26)				
*TOTALGAP*RETCEO*		0.0268				
		(0.22)				
H3: NEWCEO			0.3047			
			(0.19)			
*TOTALGAP*NEWCEO*			-0.0286			
			(-0.26)			
H4: OUTCEO				-4.1734 ***		
				(-2.70)		
*TOTALGAP*OUTCEO*				0.2733 ***		
				(2.63)		
H5: NEWOUTCEO					-1.3066	
					(-0.52)	
*TOTALGAP*NEWOUTCEO*					0.0846	
					(0.47)	
*H6: TOTALGAP*DUAL*						-0.3183 ***
						(-2.79)
R^2	0.5796	0.5802	0.5827	0.6060	0.5807	0.6026
F-statistic	19.83 ***	18.44 ***	18.45 ***	20.69 ***	20.23 ***	23.33 ***
Observations (N)	166	166	166	166	166	166
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

Table 29: Multiple Moderated Regressions of MTB

The calculation of the marginal effects of TOTALGAP on MTB shows a strengthening of the positive marginal effect for the moderator OUTCEO, as calculated before for NEWOUTCEO. For the moderating variable DUAL, a weakening effect of CEO duality on the association between CEO compensation gap and firm performance measured as MTB has been calculated, leading to a negative marginal effect, which is in line with the results for the marginal effects of DUAL when firm performance is measured as ROE and ROA. The calculations of the marginal effects are shown in Table 30, as well as the values for the 90%-confidence intervals. Table 31 provides an overview of the multiple moderated regression results of MTB.

Dependent Variable: MTB	Moderating Variable	
	OUTCEO	DUAL
Marginal effect (Z=0)	0.0958	0.1802
Marginal effect (Z=1)	0.3692	-0.1381
Confidence interval, min. (Z=0)	0.0893	0.1731
Confidence interval, max. (Z=0)	0.1024	0.1874
Confidence interval, min. (Z=1)	0.3563	-0.1522
Confidence interval, max. (Z=1)	0.3821	-0.1240

Table 30: Marginal Effects of TOTALGAP on MTB

The table summarizes the results of the multiple moderated OLS regressions of MTB.
+ denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association.

Hypothesis	Variables/Moderating Terms	Result
H3	TOTALGAP	+
H4	TOTALGAP*RETCEO	0
H5a	TOTALGAP*NEWCEO	0
H5b	TOTALGAP*OUTCEO	+
H5c	TOTALGAP*NEWOUTCEO	0
H6	TOTALGAP*DUAL	-

Table 31: Results of Multiple Moderated Regressions of MTB

Conclusion: The following significant moderating effects with regard to the relationship between TOTALGAP and MTB are found: OUTCEO shows a positive moderating effect, while DUAL shows a negative moderating effect.

3.4 Robustness Tests

In the following subchapters, additional analyses are conducted to judge the robustness of results that serve to test the persistence of the coefficients of the main variables of interest. First robustness checks were already conducted in the main part of this study: All significant coefficients in the regression models were tested for persistence in cases when only significant variables were integrated in the regression model. These "significant-only" models were also illustrated for the regressions of ROE, ROA, and MTB on the different compensation gap measures (TOTALGAP, LTGAP, and STGAP; cf. App. 3, App. 4, and App. 5). Mostly, the significant effects which the original analyses revealed were robust to compounding such "significant variables only" regression models, unless otherwise specified. At the same time, the models which only contain significant variables contribute to discover significant coefficients that had gone lost by including additional control variables with a lower significance level.

Regression results can only be described as robust if they do not depend on certain operationalizations of the variables used. Therefore, results should remain essentially unchanged if different firm performance measures are employed. In the context of the previous regression analyses, three different performance measures, i.e. ROE, ROA and MTB, have been used as dependent variables. Thereby, the robustness of results to different operationalizations of the performance variable has already been tested. Consequently, alternative performance measures will not be tested further in this chapter on robustness tests.

Since regression analysis may not prove causality, the significant regression coefficients obtained in this study cannot be considered as evidence that larger compensation gaps cause better firm performance. To get a clearer picture of underlying cause-and-effect relationships, results have to be tested for endogeneity. This is done twofold in the following chapters: Firstly, it will be tested whether results remain robust to adding firm fixed effects (Chapter 3.4.1), as firm fixed effects models control for the possibility that a constant third variable exists which may influence both compensation measures and firm performance measures. Secondly, endogeneity issues will be addressed using time-lagged compensation gap variables (Chapter 3.4.2) in order to find evidence whether larger compensation gaps actually

cause better firm performance or if the direction of causation is opposite or if there is even a loop of causation.

Furthermore, the influence of firms' industry affiliations was controlled in the regressions of Chapter 3.3 by means of industry dummies. Although not expedient for the samples used in the previous analyses, another method of controlling for industry influences is to use industry-adjusted performance measures. This method will be applied for a reduced sample as an additional robustness test (Chapter 3.4.3).

Finally, multicollinearity issues have to be considered (Chapter 3.4.4), since the correct estimation of a single independent variable's influence on the dependent variable proves difficult if this variable has only little independent variance (Hamilton, 2004: 225).

3.4.1 Firm Fixed Effects Regressions

Performing firm fixed effects regressions may be used to counter endogeneity problems (Bebchuck, Cremers, & Peyer, 2009) as it abstracts from constant, firm-specific influences that might impact both compensation gap and firm performance, and focuses on the relationship of changes in compensation gap and changes in firm performance.[174]

a) Methodology

So how do fixed effects regressions differ from OLS regressions? In firm fixed effects regressions, comparisons are drawn within one company. Thus, variation between companies ("between-company variation") is disregarded. While this approach increases standard errors, it eliminates at the same time the influence of individual characteristics on the variation between companies and increases the probability of obtaining unbiased results (Allison, 2009: 4).

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[174] Moreover, fixed effects models are a common statistical approach used frequently in quantitative studies on the topic of firm performance effects of CEO-TMT pay differences. Compare, for example, Bebchuk et al. (2009), Jonas (2007), Kale et al. (2009), and Lee et al. (2005).

Consequently, fixed effects models report the so-called *"Within-R^2"* as a measure of how much variation within one company ("within-company variation") is explained by the estimated fixed effects regression model.

Allison (2009: 2) lists two preconditions for the use of fixed effects models: Firstly, it is required to have at least two observations of the same variable for each firm which can be fulfilled in this study as the sample consists of panel data.[175] Another precondition for the use of fixed effects models is that at least some of the companies in the sample have to display different values of the independent variable of interest in at least two instances. The sample used in this study also fulfills this second requirement.[176]

The advantage of fixed effects models is that they enable controlling all characteristics of a company that do not change over time (those which are "time-invariant" or "fixed" over time), irrespective of whether these characteristics can be measured or not. This approach leads to less biased estimates (Allison, 2009: 4).

As firm fixed effects regressions control for all time-constant influences, industry effects do not have to be added as control variables in the fixed effects models because the industry association of a company is constant over time. Since firm fixed effects models measure the influence of the intra-firm variance of independent variables on the dependent variable, company characteristics that do not fluctuate over time do not provide any explanatory value for the results.[177] Therefore, the regression equation is reduced to:

$$\text{Performance} = \alpha_1 + \alpha_2 \, \text{COMPENSATION MEASURE}_{it} + \alpha_3 \, \text{SIZE}_{it} + \alpha_4 \, \text{DUAL}_{it}$$
$$+ \alpha_5 \, \text{LEV}_{it} + \alpha_6 \, \text{CEOAGE}_{it} + \alpha_7 \text{TMTCOUNT} + \alpha_8 \text{YEAR}_t + \varepsilon_{it}$$

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[175] As a result, however, sample size for the fixed effects regressions had to be adjusted by discarding all firms for which only one observation was included in the basic sample.

[176] Yet, it has to be kept in mind that some moderators only show a low variance of values as can be seen in Chapter 3.2.2 (cf. Table 10), which limits the explanatory power of these fixed effects regressions.

[177] Stata automatically omits such time-invariant variables from the calculations when performing fixed effects regressions.

b) Results

In the following, the results of the firm fixed effects regression will be discussed. Table 32 summarizes the results, while the corresponding regression tables are presented in the appendix (cf. App. 6, App. 7, App. 8, and App. 9).

The table summarizes the results of the multiple moderated fixed effects regressions of ROE, ROA and MTB. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association. ° indicates that the result slightly missed the required significance level of at least 10% in a regression model containing only significant variables.

Hypothesis	Variables/Moderating Terms	ROE	ROA	MTB
H1	CEOCOMP	+	+	+
H2	TMTCOMP	+	+	+
H3	TOTALGAP	+	+	+
H4	TOTALGAP*RETCEO	0	-	-
H5a	TOTALGAP*NEWCEO	0	0	0
H5b	TOTALGAP*OUTCEO	+	+	+
H5c	TOTALGAP*NEWOUTCEO	0	0	-
H6	TOTALGAP*DUAL	-°	0	-

Table 32: Results of Fixed Effects Regressions

Hypotheses 1 and 2 regarding the association of CEOCOMP and TMTCOMP with firm performance (corresponding to the analyses of Chapter 3.3.1) are clearly supported in the firm fixed effects regressions. The fixed effects regressions for all three performance measures (ROE, ROA and MTB) indicate significant and positive

associations of CEOCOMP and TMTCOMP with firm performance (the negative coefficient of TMTCOMP is due to the variable transformation applied). Therefore, these results underline the robustness of previous OLS regression results.

For *Hypothesis 3* regarding the link between compensation gap and firm performance (corresponding to the analyses of Chapter 3.3.2), the results are again very supportive of the results gained in the OLS regressions. Total compensation gap is shown to have a significant and positive link with firm performance in the fixed effects regressions of ROE, ROA and MTB. Consequently, the results with respect to TOTALGAP seem very robust, too.

Finally, the results for *Hypotheses 4–6* on the impact of moderating factors on the association between compensation gap and firm performance (corresponding to the analyses of Chapter 3.3.3) are not completely in line with previous OLS results.

For *Hypothesis 4*, fixed effects results add to the robustness of the negative moderating effect of RETCEO detected in the OLS regressions of ROA, by showing significant and negative coefficients for the moderating term in the fixed effects regressions for both ROA and MTB. Therefore, it seems that the presence of a retiring CEO has a negative moderating effect on the relationship between TOTALGAP and firm performance.

For *Hypothesis 5a*, no significant moderating effect of the variable NEWCEO with respect to the association of TOTALGAP with firm performance could be found in the fixed effects regressions. This corresponds to the results of the OLS regressions and underlines their robustness.

The fixed effect regressions provide further support for the positive moderating effect of OUTCEO that has been found in the OLS regressions of MTB, as the fixed effects regressions yield a positive moderating effect for all three performance measures tested (ROE, ROA, and MTB). Consequently, for *Hypothesis 5b*, firm fixed effects regressions add robustness to the positive moderating effect of OUTCEO that was shown in the OLS regressions of MTB.

For *Hypothesis 5c*, the fixed effects regressions lower the robustness of previous results which had shown a positive moderating effect of NEWOUTCEO, since in the

fixed effects regression of MTB, the moderating term shows a significant and negative coefficient. Thus, significant results for a positive and a negative moderating effect were found, leaving the direction of the moderating effect inconclusive.

Two out of three fixed effects regressions yield significant and negative coefficients for the moderating term TOTALGAP*DUAL, supporting the previously found negative moderating effect of the variable DUAL on the association between TOTALGAP and firm performance.[178] Therefore, previous results on the moderating effect stated in *Hypothesis 6* are supported by the results of the fixed effects regressions.

3.4.2 Time-lagged CEO Compensation Gap

Even though firm fixed effects models have already been calculated before to control for constant, firm-specific effects on both compensation gap and firm performance, this only controls for the endogeneity resulting from a constant third variable that is correlated with both CEO compensation gap and firm performance. Nevertheless, endogeneity issues may also arise due to an unclear direction of causation between the dependent variable and the independent variable. Thus, firm fixed effects models alone do not fully prove the absence of endogeneity.

The relation of cause and effect could be either that larger CEO compensation gaps cause higher firm performance, or that firms with higher performance increase their CEO compensation gaps. It could also be the case that the causal connection is not clearly one-way, but there is a loop of causality. One might expect that current year firm performance also influences the amount of compensation sums paid for that year, considering that variable compensation payout might depend on the size of the bonus pool, which is expected to be impacted by firm performance. However, this does not necessarily have implications on the size of CEO compensation gaps.[179]

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[178] However, the interaction term of TOTALGAP*DUAL is not robust to reducing the regression model to significant variables only in the regression of ROE. In this case, the interaction scores a $p > |t|$ of 12%, thus, marginally missing the 10%-significance level.

[179] Yet, this seems likely considering that CEOs of SMI and SMIM firms tend to have the largest variable share of total compensation compared to the other TMT members (cf. Chapter 2.1.1). Consequently, it can be expected that CEOs profit above-average from good firm performance and CEO compensation gap increases along with firm performance.

Still, issues of endogeneity should be examined further to gain some additional insights into the direction of causality for the previous regression results.

Some empirical studies circumvent the endogeneity problem by using subsequent year firm performance as the dependent variable.[180] Since subsequent year firm performance should not impact current year compensation sums, analyses with subsequent year firm performance as the dependent variable should not be subject to considerable endogeneity problems. At the same time, it might be assumed that the amount of current year compensation sums might carry over a motivational effect to the subsequent year. However, basing all independent variables on current year values and only firm performance on values of the subsequent year, which may be observed in some studies, seems less intuitive to the author of this dissertation. Therefore, the author opts for using last year's compensation gaps and testing the association with current year performance, based on a model using current year control variables, too.

Table 33 presents the results of the multiple regressions of ROE, ROA and MTB on TOTALGAP (t-1). Due to the reduced sample size below 120 observations, the interaction effects are not tested for this sample, but only the general relationship of TOTALGAP and firm performance. Both OLS and firm fixed effects regressions are conducted since firm fixed effects regressions with TOTALGAP (t-1) combine both fixed effects and lagged compensation gaps as two approaches to counteract different forms of endogeneity.[181]

The regressions of ROE yield robust results, showing a significant and positive association between TOTALGAP (t-1) and firm performance measured as ROE at a 10%-significance level. These regressions yield an R^2 of 27.4% for the OLS regression and 25.3% for the fixed effects regression. For the regressions of ROA and MTB, the coefficients of TOTALGAP (t-1) are not significant. Consequently, these results do not add to the robustness of results for ROA and MTB.

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[180] Compare, for example, Bebchuck, Cremers, and Peyer (2009); Lee, Lev, and Yeo (2009); Siegel and Hambrick (2005); Carpenter and Sanders (2004).

[181] For the fixed effects regressions, the sample size is further reduced as a consequence of the elimination of singletons.

The table shows the regressions of ROE, ROA and MTB on TOTALGAP (t-1). Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. For the fixed effects regressions (FE), standard errors are clustered by firm. All regressions contain year dummies, the OLS regressions also include industry dummies (both not shown). The R^2 indicated for the fixed effects regressions is the Within-R^2. The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	ROE		ROA		MTB	
	OLS	FE	OLS	FE	OLS	FE
Intercept	-0.2066	1.1712	0.0234	0.4993	1.2145	15.8850 ***
	(-0.80)	(1.18)	(0.22)	(1.35)	(1.46)	(4.65)
TOTALGAP (t-1)	0.0327 *	0.0685 *	0.0088	0.0114	0.0351	-0.0878
	(1.90)	(1.97)	(1.05)	(1.01)	(0.57)	(-1.17)
SIZE	0.0405	-0.2201 *	0.0234	-0.0556	-0.0329	-1.5800 ***
	(1.53)	(-1.90)	(1.59)	(-1.45)	(-0.61)	(-3.65)
DUAL	-0.0111	0.0045	-0.0216	-0.0052	0.1313	0.1596
	(-0.20)	(0.08)	(-0.90)	(-0.30)	(0.65)	(0.87)
LEV	-0.0980	0.5374 **	-0.2078 ***	-0.0208	0.1498	1.9505 ***
	(-0.58)	(2.04)	(-2.79)	(-0.29)	(0.38)	(4.50)
CEOAGE	-0.0037	-0.0003	-0.0013	0.0001	-0.0026	0.0017
	(-1.42)	(-0.14)	(-0.98)	(0.10)	(-0.27)	(0.14)
TMTCOUNT	-0.0159	-0.1289	-0.0117	-0.0357 *	-0.1071	-0.0155
	(-0.37)	(-1.40)	(-0.72)	(-1.84)	(-0.82)	(-0.07)
R^2	0.2737	0.2526	0.3076	0.0948	0.5794	0.5311
F-statistic	8.73 ***	1.87 *	10.46 ***	1.71	112.02 ***	10.09 ***
Observations (N)	110	103	110	103	108	100
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	no	yes	no	yes	no

Table 33: Results of Multiple Regressions on TOTALGAP (t-1)

3.4.3 Alternative Industry Controls

In the empirical analyses, dummy variables were employed to control for industry effects. Another, slightly stricter approach is to employ industry-adjusted firm performance as the dependent variable. Nonetheless, due to the partly low number of firm observations per industry and year, industry adjustments cannot be applied to the whole sample. To ensure a sufficient number of firm observations per industry and year, the sample has to be cut down to the major industry affiliations which are the industrial goods, consumer goods, health and financial services industries. With this

reduced sample, regressions of industry-adjusted ROE, industry-adjusted ROA, and industry-adjusted MTB on TOTALGAP and moderating variables are performed as an additional robustness check (results are displayed in App. 10, App. 11 and App. 12). In these regressions, therefore, industry effects were controlled in a twofold way: Firstly, through industry-adjusted performance measures and secondly, through the employment of industry dummies.

The associations of TOTALGAP with the industry-adjusted firm performance variables ROE and ROA remain fairly robust: TOTALGAP displays significant and positive regression coefficients in the basic regressions of industry-adjusted ROE and industry-adjusted ROA. Yet, the industry-adjusted regression of MTB yields no significant coefficient for TOTALGAP.

Regarding the moderating effects, these regressions yield less significant results. Yet, this may also be related to the reduced size of the sample. Since according to Stone-Romero and Anderson (1994) even medium to strong moderating effects are often not detected within samples smaller than 120 observations, the sample size of about 130 observations is located at the lower end.

For the regressions of ROE, NEWOUTCEO shows a highly significant and positive regression coefficient. This is in line with the coefficient signs found in most regressions on the moderating variable NEWOUTCEO. However, as a negative and significant coefficient has also been found for this moderating term, the results of this robustness test can only slightly strengthen the confidence in the obtained positive direction of association.

Furthermore, DUAL yields significant and negative regression coefficients for all three regressions (of industry-adjusted ROE, industry-adjusted ROA and industry-adjusted MTB). This is in line with previous findings on the moderating effect of

CEO duality and, therefore, strengthens the robustness of previous results even further.[182]

In the regressions of industry-adjusted MTB, OUTCEO yields a significant and positive coefficient for the moderating term, which is in line with previous results for MTB and supports the generally positive moderating effect of the variable OUTCEO that has been shown before. Table 34 summarizes the results of these robustness tests with industry-adjusted firm performance measures.

The table summarizes the results of the multiple moderated regressions of industry-adjusted ROE, ROA and MTB. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association. ° indicates that the result slightly missed the required significance level of at least 10% in a regression model containing only significant variables.

Hypothesis	Variables/Moderating Terms	ROE	ROA	MTB
H3	TOTALGAP	+	+	0
H4	TOTALGAP*RETCEO	0	0	0
H5a	TOTALGAP*NEWCEO	0	0	0
H5b	TOTALGAP*OUTCEO	0	0	+
H5c	TOTALGAP*NEWOUTCEO	+	0	0
H6	TOTALGAP*DUAL	-°	-°	-

Table 34: Results of Regressions of Industry-adjusted Firm Performance

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[182] Yet, it has to be noted that for the regressions of industry-adjusted ROE and industry-adjusted ROA, significance of the moderating coefficient is lost when compounding a regression model which contains only significant variables. Thus, this interaction effect seems to be weaker in these modified regressions.

3.4.4 Multicollinearity Tests

As noted by Backhaus et al. (2000: 41) are linear regression models based on the assumption that independent variables are not completely linearly dependent: While a certain degree of linear interdependence is a common feature of empirical data, stronger forms of linear interdependence of independent variables increase the standard errors of regression coefficients and lead to inefficient estimates. In such cases, it is difficult to assess the influence of an independent variable on the dependent variable if this independent variable is highly correlated with another independent variable and, therefore, these two variables' variance is correlated (Hamilton, 2004: 225). Hence, the relevance of multicollinearity issues has to be tested.

The correlation matrix may be used as a starting point to examine collinearity between two independent variables (i.e. pairwise correlations). According to the rule of thumb by Schendera (2008: 136), collinearity becomes an issue in case of correlation coefficients larger than 0.7. According to Hair et al. (2006: 227), substantial collinearity exists for correlations above 0.9. The correlation matrix for the regressions in this study is given in Chapter 3.2.3. All relevant correlation coefficients are clearly below the lower threshold of 0.7 so that pairwise collinearity should not pose any problems.

Nonetheless, despite the low correlation coefficients of the independent variables, significant multicollinearity may be present within a regression model if, for example three or more variables are correlated. To detect such multicollinearity, each independent variable is regressed on the entire set of other independent variables, and subsequently, the proportion of independent variance is calculated as $(1-R^2)$. The result of $1/(1-R^2)$ is referred to as the variance inflation factor (VIF) (Hair et al., 2006: 227). The most widely used rule of thumb to judge multicollinearity based on VIF values indicates that a VIF factor of greater than 10 is considered as a sign for serious multicollinearity (cf. for example Chatterjee, Hadi, & Price, 2000; Hair et al., 2006: 230).

The variance inflation factors for the two different basic samples used in the multiple OLS regressions (ROE and ROA versus MTB) are shown in the Appendix (cf. App.13 for the regressions of ROE and ROA, and App. 14 for the regressions of MTB), since sample size for the basic sample of MTB is somewhat smaller. Since all VIFs are well below 10, multicollinearity should not be an issue.

3.4.5 Summary

Overall, the regression results seem to be relatively robust. The regressions based on different operationalizations of the performance variables, as well as the fixed effects regressions provide strong support for the general hypotheses of a positive association of CEO compensation, TMT compensation, and CEO compensation gap with firm performance, as postulated in *Hypotheses 1–3*. Also results for the moderator DUAL are very robust and clearly support *Hypothesis 6*. Furthermore, relatively robust results are obtained for the moderators RETCEO and OUTCEO, which both lead to a rejection of *Hypotheses 4* and *5b*.

The tests for endogeneity based on time-lagged CEO compensation gap yielded mixed results. While the association of TOTALGAP (t-1) with ROE seems to be relatively robust, analyses for ROA and MTB did not show significant results. Consequently, endogeneity issues may not be completely ruled out, but a certain degree of mutual interdependency between the variables CEO compensation gap and firm performance seems to be realistic, taking into account the design of compensation systems which are to a significant extent based on performance goals. Ultimately, it boils down to a chicken-and-egg question, i.e. if performance increases as a result of good compensation design, meaning an efficient link between pay and individual and/or firm performance (which is the viewpoint of this dissertation), or if compensation increases as a result of better firm performance (which is also a reflection of a good pay-for-performance link).

The results for the regressions based on stricter operationalizations of the industry controls by means of industry-adjusted performance measures further underline the robustness of results for TOTALGAP as well as for the moderators OUTCEO and

DUAL. Moreover, robustness tests did not provide evidence for the presence of substantial collinearity.

Overall, considering the general difficulty to provide evidence for the existence of a link between pay and firm performance and the various tests performed in this study, it is not surprising that the results for some variables, mainly moderating variables, are not strictly robust in all regressions. However, the compelling evidence for the existence of a robust general relationship between CEO compensation gap and firm performance, as well as for the validity of some moderating variables, is a very positive finding.

Conclusion: The robustness tests support the results of previous analyses, especially for the general relationships of CEOCOMP, TMTCOMP and TOTALGAP with firm performance, but also the findings for the moderating effects are confirmed, especially for the variables DUAL, RETCEO and OUTCEO. However, endogeneity issues should be kept in mind.

3.5 Discussion of Results

Table 35 summarizes the results obtained in the regressions of ROE, ROA and MTB, both in the OLS regressions of Chapters 3.3.1 to 3.3.3 and in the fixed effects regressions of Chapter 3.4.1. The results of the other robustness tests are not included in the overview, since they are not available for all hypotheses that are tested[183] and since their results do not change the final evaluation of the hypotheses. Furthermore, as fixed effects regressions are a frequently used regression model in comparable studies, the selection of regression models presented in this overview will contribute to increased comparability. All three compensation variables (CEOCOMP, TMTCOMP and TOTALGAP) refer to the respective multiple regressions without moderating terms, while the moderating terms (at the bottom of the table) are taken from the tables which display the moderated regression results for the respective

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[183] The robustness test for time-lagged CEO compensation gap could not be performed for the moderated regressions due to sample constraints.

performance measure. These results are discussed and interpreted in this chapter, with reference to the hypotheses.

The table summarizes the results of the multiple moderated regressions of ROE, ROA and MTB. + denotes a significant and positive association at the 10%-level or lower; - denotes a significant and negative association at the 10%-level or lower; 0 denotes no significant association. ° indicates that the result slightly missed the required significance level of at least 10% in a regression model containing only significant variables.

		Dependent Variable						Total
		ROE		ROA		MTB		
		OLS	FE	OLS	FE	OLS	FE	
H1	CEOCOMP	+	+	+	+	+	+	+
H2	TMTCOMP	+	+	0	+	+	+	+
H3	TOTALGAP	+	+	+	+	+	+	+
H4	TOTALGAP*RETCEO	0	0	-°	-	0	-	-
H5a	TOTALGAP*NEWCEO	0	0	0	0	0	0	0
H5b	TOTALGAP*OUTCEO	0	+	0	+	+	+	+
H5c	TOTALGAP*NEWOUTCEO	+	0	+	0	0	-	0
H6	TOTALGAP*DUAL	-	-°	-	0	-	-	-

Table 35: Overview of Regression Results

a) Compensation Measures: H1–H3

In general, all compensation measures have a quite robust and positive association with firm performance. This is also true for TMTCOMP, even though it constantly displays negative regression coefficients, resulting from the variable transformation employed. The strongest results are obtained for CEOCOMP and TOTALGAP which show significant results for all regressions which are displayed in the overview, closely followed by TMTCOMP which is significant in five out of six regressions.

Therefore, the results strongly support *Hypotheses 1 and 2* on the *positive association between CEOCOMP*, or *TMTCOMP, and firm performance* for the Swiss-based sample of this dissertation, which is in line with agency theory postulates.

Furthermore, results strongly support *Hypothesis 3* that compensation gap, measured as TOTALCOMP, has a significant and positive association with firm performance. These results are independent of the operationalization of the firm performance measure (such as ROE, ROA and MTB). Thus*, larger CEO compensation gaps seem to be positively associated with firm performance, as proposed by tournament theory.*

The direction of this association is in line with Kale et al. (2009) who also find a significant and positive relationship between ROA and CEO pay gap for their US-based sample. Moreover, the generally positive association of CEO-TMT compensation differences and firm performance is further supported by the findings of Main et al. (1993), Eriksson (1999), and Lee et al. (2008).

In contrast to Henderson and Fredrickson (2001: 107), who showed a stronger association of firm performance with long-term compensation gap, such an association is not confirmed in the analyses of this study. While long-term compensation gap (LTGAP) yields mostly significant and positive associations with firm performance, strongest results in terms of significance levels of regression coefficients for the compensation gap variable are obtained when using the compensation gap measure based on total compensation (TOTALGAP). Analyses based on short-term compensation gaps (STGAP) yield still less significant results than those based on long-term compensation gaps.

b) Moderating Variables: H4–H6

Results for *Hypothesis 4* are quite robust, displaying significant and negative regression coefficients for the moderating term TOTALGAP*RETCEO in the OLS regressions of ROA as well as in the fixed effects regressions of ROA and MTB, slightly missing the 10%-significance level in the fixed effects regression of ROE. However, the direction of the regression coefficient for the moderating term TOTALGAP*RETCEO is opposite to the tournament theory prediction of *Hypothesis 4*: The negative coefficient indicates that *a retiring CEO in office does not seem to increase tournament incentives for an existing CEO compensation gap*, but instead

has *a negative moderating effect on the relationship between CEO compensation gap and firm performance*. Thus, *Hypothesis 4* has to be rejected. This finding contrasts with Kale, Reis, and Venkateswaran (2009: 1502) who reported a positive moderating effect of RETCEO on the association of CEO compensation gap with firm performance.

What alternative explanation for the negative coefficient of the moderating term RETCEO*TOTALGAP can be given? Research has documented that risk aversion increases with CEO age, also reflected in the fact that older CEOs tend to base their decisions on a larger information base and take more time to decide (Vroom & Pahl, 1971; Taylor, 1975). While this may often be an asset, fast decision processes may in certain situations be crucial for business success, especially in less predictable business settings such as the financial crisis which occurred during the sample period. Thus, the negative coefficient of the moderating term (RETCEO*TOTALGAP) might be explained by the slower decision making attributed to older CEOs, leading to a lower firm performance at a certain CEO compensation gap compared to firms with younger CEOs.

Secondly, one might argue in line with Bebchuk and Fried (2003) that older CEOs have a stronger personal network, most probably also with the members of the board of directors, and, therefore, dispose of higher power to negotiate larger compensation packages. This line of argument is in accord with "managerial power theory" which posits that executive compensation does not only constitute an instrument to counter agency problems, but is also influenced by agency problems itself. As Bebchuk and Fried (2003) note, managers are deemed to have substantial power to influence their compensation packages which manifests itself in managerial rent seeking. Consequently, compensation packages may be inflated and may not be able to realize the expected incentive effects, leading to a weaker (or even negative) association between CEO compensation gap and firm performance.

Thirdly, it might also be possible that the higher compensation gaps observed for older CEOs,[184] which are already indicated in the correlation analysis in Chapter 3.2.3, can be accounted for by the higher level of experience of older CEOs who are

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[184] The variable RETCEO is "1," if the CEO is older than 62 years.

close to retirement. However, if this is the case, the greater experience subsequently did not seem to translate into better firm performance for the sample analyzed. In other words, this indicates that the association between pay and performance decreases for CEOs of a higher age, and presumably, having a higher level of experience. This is in line with the findings of Barro and Barro (1990) that for bank CEOs, the sensitivity of pay to performance decreases with CEO experience.

Hypothesis 5a states that in firms with a new CEO in office, the relationship between TOTALGAP and firm performance is lower due to lower tournament incentives. This hypothesis cannot be confirmed based on the analyses since none of the regressions yields significant coefficients for the moderating term TOTALGAP*NEWCEO. Thus, having a new CEO in office does not seem to have an impact on the association of CEO compensation gap with firm performance. Consequently, *NEWCEO does not constitute a significant moderating variable for the relationship between CEO compensation gap and firm performance* for the sample at hand. This contradicts *Hypothesis 5a* which, therefore, has to be rejected.

The moderating variable OUTCEO is assumed to have a negative moderating effect on the association between TOTALGAP and firm performance, as stated in *Hypothesis 5b*. However, OUTCEO yields significant and positive moderating terms in the OLS regression of MTB and in all fixed effects regressions. Therefore, results are quite robust, but the sign of the moderating effect is opposite to the hypothesized direction. *Employing a CEO from outside the firm seems to strengthen the association between TOTALGAP and firm performance.* This is contrary to tournament theory argumentation that having an outside CEO lowers performance incentives for the TMT and is, therefore, associated with lower firm performance for a given compensation gap. Consequently, *Hypothesis 5b* has to be clearly rejected.

How may these contrasting findings be explained? Again, the managerial power approach might provide an explanation. Bebchuk and Fried (2003) note that such negotiations with CEO candidates from outside the firm can be assumed to be closer to the arm's length negotiation model.[185] Therefore, CEOs hired from outside the firm may receive more moderate compensation packages than inside CEOs, but despite the

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[185] Even though Bebchuk and Fried (2003) still cite several arguments due to which these negotiations suffer from managerial power issues, too.

lower compensation achieve comparable firm performance. Such less inflated CEO compensation packages might in turn lead to a stronger association between CEO compensation gap and firm performance.

Hypothesis 5c states that for firms with a new CEO hired from outside the firm, the relationship between CEO compensation gap and firm performance is weaker. Nevertheless, the OLS regressions of ROE and ROA yield significant and positive coefficients for the moderating term TOTALGAP*NEWOUTCEO, whereas the fixed effects regression of MTB yields a negative and significant regression coefficient for the moderating term. Some regressions also show no significant results for this moderating term. As the direction of significant coefficients is not consistent, *results are not robust*. Due to these inconsistent results, *Hypothesis 5c* is rejected.

Overall, *Hypothesis 5*, consisting of three sub-hypotheses, is rejected as results are either not significant (*Hypothesis 5a*), inconsistent (*Hypothesis 5c*), or the direction of association is contrary to the hypothesis (*Hypothesis 5b*).

Hypothesis 6 states a negative moderating effect of CEO duality on the relationship between CEO compensation gap and firm performance. The regressions with CEO duality as the moderator yield the highest number of significant regression coefficients for the moderating terms of all moderators tested in this dissertation. Negative and significant coefficients were obtained for the moderating term in the OLS regressions of ROE, ROA and MTB, as well as in the fixed effects regressions of ROE and MTB. Only one of the main regressions included in the overview yields an insignificant moderating coefficient. Thus, results for the moderator DUAL are very robust and provide evidence in support of *Hypothesis 6*. This indicates that *if the CEO doubles as chairman of the board of directors, the positive association between compensation gap and firm performance is reduced,* and may even be reversed as indicated in the marginal product calculations. The finding is in line with tournament theory predictions, which consider CEO duality to be an indicator for a highly trusted CEO who is unlikely to have to leave their position shortly, which diminishes tournament incentives for the rest of the TMT, eventually resulting in lower firm performance. Therefore, *Hypothesis 6* is confirmed.

The fact remains, however, that the underlying tournament theory reasoning seems rather US-specific where it is very common that a CEO also chairs the board of

directors, whereas this tends to be an exception in Swiss SMI and SMIM firms (cf. Chapters 2.1.2 and 3.2.2). Despite the empirical support for *Hypothesis 6*, it may, therefore, be questioned to what extent the underlying argument actually holds. When rephrasing this finding regarding CEO duality, other interpretations might come to one's mind, too.

Simply put, if the CEO is at the same time chairman of the board of directors, the compensation gap at a certain firm performance level is larger than if the CEO had simultaneously not the position of chairman of the board of directors (ceteris paribus). This result is in line with, for example, Kale et al. (2009) and Lee et al. (2005). The latter relate it to the finding of Core et al. (1999: 385) who state that CEOs who are, at the same time, chairman of the board of directors earn a significant pay premium. One might seek to justify this pay premium by arguing that CEOs who also serve as chairman of the board of directors have two jobs for which they get paid and thus, deserve a higher compensation sum. However, the counter-argument is that a CEO only has 100% of time at their disposal.

If a CEO is at the same time chairman of the board, they can execute each function only as a part-time job. In that sense, a justified pay premium would only make intuitive sense if the position of chairman of the board featured a higher remuneration which increases total CEO/chairman compensation, even though it is only included in parts, reflecting the actual time-wise involvement of the CEO as chairman of the board. Hilb (2007: 25) also recommends that in cases of CEO duality, separate compensation sums for each of the job functions of the executive should be calculated which are proportionate to their time-wise involvement in each job (CEO and chairman). Thus, the CEO function and the chairman function should actually be viewed and rewarded as two separate part-time jobs.

The results and conclusions with regard to the tested hypotheses are summarized in Table 36. Overall, four hypotheses are accepted (*Hypotheses 1, 2, 3*, and *6*). For two hypotheses (*Hypotheses 4* and *5b*), evidence for a contrary effect was found, leading to the rejection of the hypotheses. *Hypotheses 5a* and *5c* were rejected due to insignificant or inconsistent results. Thus, all three sub-hypotheses of *Hypothesis 5* were rejected, leading to an overall rejection of *Hypothesis 5*.

Hypothesis		Result	Significance
H1	The higher the CEO compensation, the better the firm performance.	✓	+
H2	The higher the average TMT compensation, the better the firm performance.	✓	+
H3	The larger the CEO pay gap, the better the firm performance.	✓	+
H4	If the CEO of a firm is close to retirement age, CEO pay gap and firm performance are more positively related.	✗	-
H5	In the presence of certain factors relating to CEO recruitment, CEO pay gap and firm performance are less positively related.	✗	
	a) If a firm has a new CEO, CEO pay gap and firm performance will be less positively related.		0
	b) If the CEO was hired from outside the firm, CEO pay gap and firm performance will be less positively related.		+
	c) If a firm has a new CEO who has been hired from outside the firm, CEO pay gap and firm performance will be even less positively related.		0
H6	In case of CEO duality, CEO pay gap and firm performance will be less positively related.	✓	-

✓ Hypothesis accepted
✗ Hypothesis rejected

+ Significant (p<10%) and positive (moderating) effect
- Significant (p<10%) and negative (moderating) effect
0 Insignificant (p>10%) or inconsistent (moderating) effect

Table 36: Results of Hypotheses Tests

What can be inferred from these results with regard to the compensation theories discussed in Chapter 2.2? Since *Hypotheses 1 and 2* reflect agency theory ideas, their acceptance supports a functioning agency setup within the sample companies and reflects a functioning pay-for-performance link. *Hypotheses 3–6* were formulated based on tournament theory. Thus, finding evidence in support of these hypotheses can be judged as evidence for the validity of tournament theory. However, only *Hypothesis 3* on the general relationship of CEO compensation gap and firm performance, and *Hypothesis 6* on the moderating effect of CEO duality are supported by the data. Further significant, but contrary effects were found for *Hypotheses 4* and *5b*. These contrary moderating effects for *Hypotheses 4* and *5b* are neither supportive of tournament theory nor equity theory. Consequently, the study does not provide

consistent support for any of these two major theories, even though some indications for tournament theory elements are detected. Furthermore, team player theory might still be applicable for the most part, despite the positive association between CEO compensation gap and firm performance which is in line with tournament theory predictions. This can be argued based on the following reasons: Firstly, the positive association of CEO compensation gaps with firm performance does not rule out the possibility that compensation differences among executive board members could potentially be traced back to differences in marginal productivity. Secondly, the CEO was not the highest paid executive board member in all companies of the basic population. But since firms in which the CEO was not the highest paid executive board member were excluded from the sample, such firms are not reflected in the results. However, the mere existence of such firms indicates that a strict tournament theory-like pay distribution cannot be found in all firms of the basic population. The existence of cases in which the CEO was not the highest paid manager in the firm rather hints at the potential validity of team player theory, as this theory rewards differences in marginal products and the CEO does not necessarily always create the highest marginal product. The applicability of these theories will be discussed in more detail in Chapter 4.

Another observation is that in general, results seem to favor fixed effects models, since the number of significant results is notably higher for these models. This might hint at the presence of time-constant unobserved variables which have an effect on both CEO compensation gap and firm performance. For this study, such an unobserved variable could be CEO ability,[186] as higher CEO ability is expected to lead to both a higher compensation sum for the CEO as well as better firm performance (cf. Kale et al., 2009: 1493). Furthermore, differences in firm culture might also have an impact on the relationship between TOTALGAP and firm performance. Due to the within-comparison employed by fixed effects models, the influence of such time-constant, firm-specific factors can be excluded which leads to less biased results.

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[186] This is, however, based on the assumption that no CEO changes occurred within the sample period.

Finally, the results of this research work are contrasted with the results of US studies for the same moderators. As can be seen in Table 37, the results of US studies with regard to moderating factors do not coincide with the results of this research work based on a Swiss sample. Only the direction of influence of the moderator DUAL corresponds to the results of the US studies. This hints at country-specific factors which impact the results, underlining that US results may not simply be considered valid for other national contexts.[187]

The table contrasts the results of US studies with the results for the moderators tested in this thesis based on a Swiss sample. + indicates that a moderator strengthens the relationship of executive compensation disparity and firm performance; - indicates that a moderator weakens this relationship; 0 indicates that no effect of the moderator could be found. -- for NEWOUTCEO indicates an even stronger effect of the combined moderator than the sole effect of NEWCEO.

Moderator	Authors of US Study	Results	
		US	CH
RETCEO	Kale et al. (2009)	+	-
NEWCEO	Kale et al. (2009)	-	0
OUTCEO	Bebchuk et al. (2009)	0	+
NEWOUTCEO	Kale et al. (2009)	--	0
DUAL	Kale et al. (2009); Lee et al. (2005)	-	-

Table 37: US versus Swiss Results on Influence of Moderators

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[187] Yet, these differences in results should not be overrated since even results of executive compensation studies within the US sometimes show different results due to variations in the operationalization and selection of variables, or the sample used for the quantitative analyses.

3.6 Limitations of Quantitative Research

"Modern epistemology states that proof is a goal
that is never achieved by social scientists
or any scientist for that matter."
(Kenny, 1979: 2)

The quote by Kenny summarizes quite well the limitations of quantitative research as performed in this study. While the researcher strives to capture relationships of interest most accurately, there are significant limitations of the research methodology that prevent definitive proof of the underlying theory. Thus, keeping these limitations in mind, *"the scientist should never speak the words truth or proof but always keep them in mind"* (Kenny, 1979: 2). The limitations to be discussed below relate to the definition of variables and the formulation of regression models (Chapter 3.6.1), the sample selection and characteristics (Chapter 3.6.2), and the quantitative methodology employed in general (Chapter 3.6.3).

3.6.1 Definition of Variables and Regression Model Formulation

The definition of variables has an important influence on the results of regressions. As results may vary due to the operationalization of variables, the study relies on several alternative operationalizations of the firm performance variable and takes into account different sorts of industry controls. While these additional tests help to gauge the impact of the operationalization of certain variables on results, no final judgment can be made on these grounds. Besides, no such supplementary tests of variable operationalization were performed for the remaining variables. Therefore, the outcomes may still be impacted by changes in the operationalization of these remaining variables or untested alternative operationalizations of the firm performance or industry variables. Furthermore, the financial point of view reflected in the selection of firm performance variables has to be highlighted. This view does not embrace other relevant firm contributions such as benefits for stakeholders like employees, customers, the society or the environment. However, these also reflect potential dimensions of overall firm performance.

Models are built based on existing theory and are dependent on data availability. As a result, specification errors within the regression models may occur due to omitted relevant variables. CEO (and executives') skills and abilities might for instance constitute such variables that were not directly controlled for, but which are expected to have an impact on both CEO compensation gap and firm performance (cf. Henderson & Fredrickson, 2001: 113). Disregarding CEO changes within the sampling period, these differences in skills were taken into account in the fixed effects regressions, based on the assumption that CEO skills and ability do not vary over time. The robustness tests based on fixed effects models showed that the potential lack of such time-constant, firm-specific variables in the regression models does not notably impact results. However, other potentially omitted variables that vary over time and across the firms which are included in the sample may still impact results.

3.6.2   Sample Selection and Characteristics

Further limitations arise from sampling choices and characteristics of the sample. Firstly, the sample is based on panel data of the largest publicly traded companies in Switzerland (SMI and SMIM firms). This limits generalizability of results insofar as results may not be applicable to smaller, non-traded Swiss firms, or comparable firms which are not based in Switzerland. Secondly, the dataset is drawn from a limited, four-year time period including the recent financial crisis. Consequently, the results may, at least partly, reflect these specific circumstances of the time period in which the variables were observed, and results may not be fully applicable for instance to periods of strong economic growth. Thirdly, the analyses are based on the concept of CEO compensation gap. Consequently, the sample only includes firms in which the CEO is also the highest paid member of the executive board while excluding firms with a non-CEO highest-paid top manager. Therefore, the results may not be applicable to the latter type of firms.

While the first three limitations with respect to the sampling choice are mainly related to reduced generalizability, the fourth limitation relates to impairments in the statistical analyses by means of multiple moderated regressions (MMR), namely reduced statistical power. As Aguinis (1995) notes: *"In the context of MMR, power is the probability of rejecting a false null hypothesis of no moderating effect. If power is low, type II statistical error rates are high and, thus, researchers may erroneously dismiss theoretical models that include moderating effects"* (1142). Factors leading to lower power in moderated multiple regressions are small sample sizes (as noted in Chapter 3.1.1) and unequal distribution of the number of observations in each subgroup of values which the moderator can take (e.g. for the moderator variable Z, operationalized as a 0,1-dummy variable – a notably lower number of observations with Z=1 than Z=0). The latter can also be observed for the moderating variables in this study. Nonetheless, following the explications above, this limitation concerns regression results for moderators that show an insignificant regression coefficient for the moderating term, not moderating effects that yield significant results. As a consequence, moderating variables for which no significant results were obtained may actually turn out to have a significant influence if sample size is increased and/or the proportion of the number of subgroup values for the moderator is made more equal (Aguinis, 1995).

3.6.3 General Quantitative Methodology

In general, regression analysis only provides information with regard to the strengths and direction of the relationship between two or more variables, but does not imply a causal link between variables (cf. also Gujarati, 2003: 22 ff.). Consequently, inferences regarding causal connections have to be drawn in combination with theoretical arguments. As noted before, endogeneity issues have to be taken into account in this regard due to the potential loop of causation between CEO compensation gap and firm performance of the same year (cf. Chapter 3.4.2). To circumvent this issue of reverse causation, calculations were repeated with a lagged compensation variable, using CEO compensation gaps of the previous year. These supplemental analyses tended to support the positive association of CEO compensation gap with firm performance measured as ROE. However, this still does not prove a definite one-way direction of causation.

Despite the addressed inherent uncertainties, the regression model applied in this study may constitute a helpful explanatory model, providing insights into which factors are linked with firm performance and contribute substantially to explaining the level of observed performance. The discussed limitations have to be kept in mind when drawing inferences for theory and practice based on the results of this study, which will be the topic of the following chapters.

4 CDM Framework

This chapter describes a compensation disparity management (CDM) framework which is derived from the insights of the qualitative research (cf. Chapter 2) and the quantitative research (cf. Chapter 3). Furthermore, it relies to some extent on additional quantitative and qualitative comparisons drawn within the set of sample companies and its basic population. Consequently, the CDM framework constitutes a synthesis of this research work (cf. Figure 18). The chapter is structured in two subchapters: In Chapter 4.1, the framework is introduced, followed by Chapter 4.2 which describes the components of the CDM framework in detail.

4.1 Introduction to the CDM Framework

The CDM framework is introduced by outlining its objectives (Chapter 4.1.1) and describing the process and content considered in its development (Chapter 4.1.2).

4.1.1 Objectives of the CDM Framework

While the process and results of the quantitative analyses of this dissertation (cf. Chapter 3) most likely rather appeal to the scientific community in the research field of executive compensation, this chapter will bridge the gap to the executive compensation practitioners.

The CDM framework incorporates the scientific insights of this research work and has the main purpose to present an action-oriented approach for managing the compensation differences within the executive board in a way that is conducive to firm performance. Since only aggregated TMT compensation figures are available, its propositions regarding compensation differences within the executive board mainly refer again to the differences between CEO compensation and average TMT compensation.

In detail, the CDM framework

- highlights the context factors to be observed when it comes to taking decisions relating to CEO-TMT compensation disparity management (Chapter 4.2.2).

- presents a classification grid to assign a CDM approach to companies based on four general CDM company clusters (Chapter 4.2.3).

- provides recommendations, including typological implementation paths, with concrete advice on the configuration of compensation parameters in general and for the respective company clusters (Chapter 4.2.4).

4.1.2 Development of the CDM Framework

The development of the CDM framework connects the qualitative explications of Chapter 2 and the quantitative analyses of Chapter 3. The qualitative research results, referring to country characteristics of Switzerland, theories on CEO-TMT pay distribution and exemplary executive compensation concepts, build the basis and reference framework for the subsequent interpretation of the results of the quantitative analyses. The latter rely on descriptive and inferential statistics to generate further insights into the association between CEO compensation gaps and firm performance. Finally, the CDM framework constitutes the synopsis of both qualitative and quantitative research work, linking their results with the goal of deducing practical recommendations for CEO-TMT compensation disparity management.

Figure 18 illustrates this high-level description of the CDM framework development process. More detailed explanations can be found in the respective subchapters describing the three main elements of the framework.
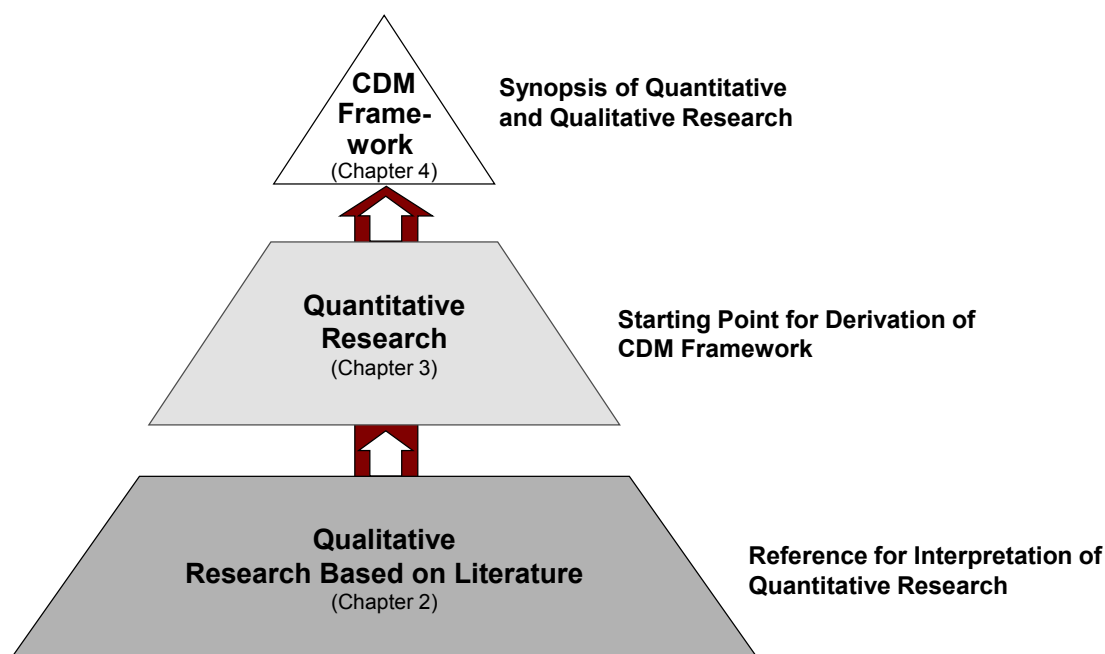
Figure 18: CDM Framework Development

4.2   Description of the CDM Framework

The following framework is tailored to that part of overall compensation design which deals with the configuration of compensation disparity within the executive board as measured by CEO compensation gap, or CEO compensation multiple.[188] The chapter starts with an overview of the framework elements (Chapter 4.2.1), followed by a detailed description of each element (Chapters 4.2.2 to 4.2.4).

4.2.1   Overview of Framework Elements

The CDM framework consists of three main elements (cf. Figure 19): The first element, the *contextual basis*, forms the foundation of the framework. It describes the target group of the framework ("*Who?*"), the Switzerland-specific contextual factors that have to be considered when taking decisions relating to CEO-TMT compensation

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[188] The CDM framework only refers to compensation disparity within the executive board (measured by CEO compensation gap or CEO compensation multiple, or the compensation gap or multiple between the highest paid member of the executive board and the other executive board members) and not to compensation dispersion (meaning the compensation distribution among the members of the executive board) as compensation figures for individual TMT members are generally not published by the companies and consequently, could not be analyzed in this study.

disparity ("*What?*") and the importance of compensation disparity management ("*Why?*").

The second element, termed *compensation disparity analysis and classification*, presents the process of deriving *CDM company clusters* and corresponding compensation disparity approaches for each cluster. The derivation process is based on the *moderated regression functions,* but simultaneously, the derived compensation disparity clusters also impact the implementation of insights gained in the regression analyses.

Compensation disparity management, the third element of the framework, represents the most action-oriented element. It explains two starting points for managing CEO-TMT compensation disparity in view of its association with firm performance: *Configuration of Compensation Parameters* outlines implementation paths for compensation disparity management in general as well as for each compensation disparity approach within the company cluster matrix, whereas the subchapter on *CDM Principles* aggregates the insights of the framework into superordinate general principles for the management of compensation disparity, grounded on the reversed KISS principles by Hilb (2005: 7).
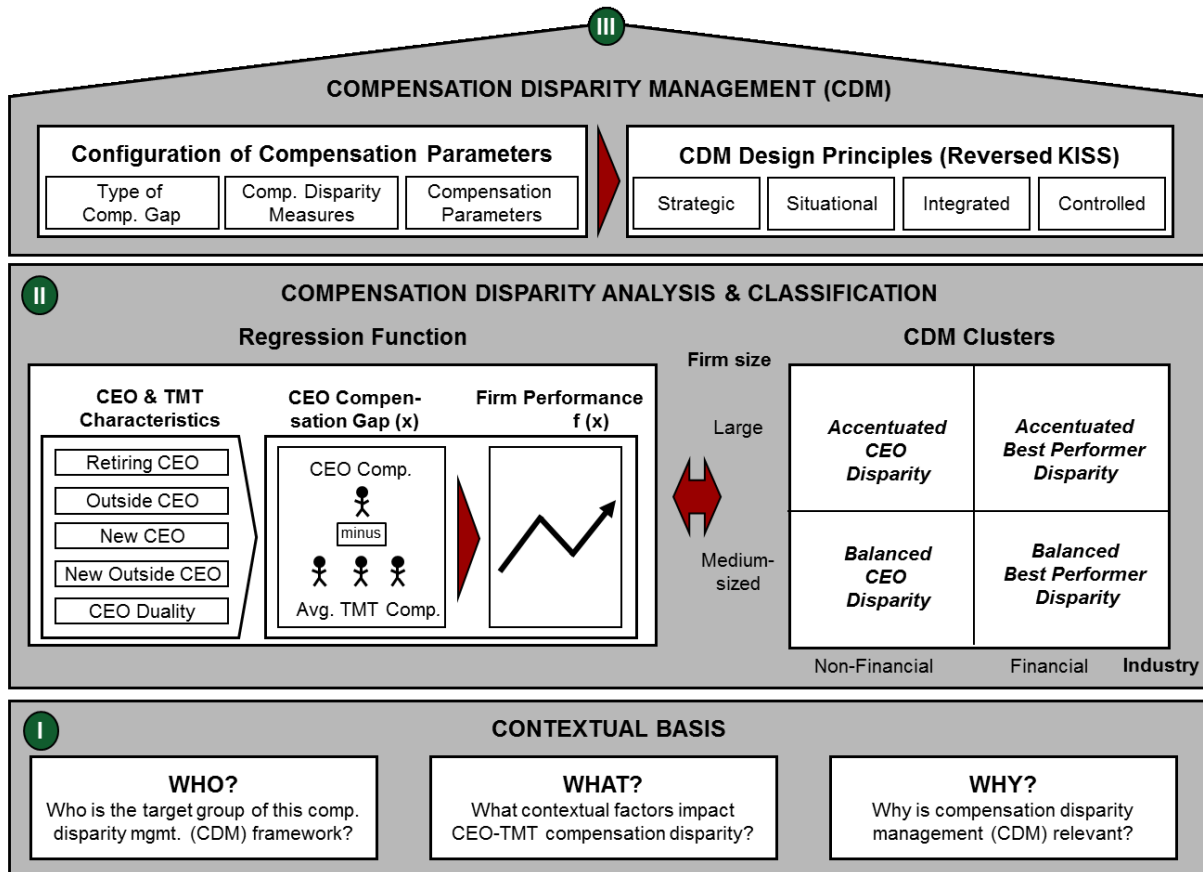
Figure 19: CDM Framework

4.2.2 Contextual Basis

The contextual basis can be seen as the foundation for analyzing, designing and implementing suitable CEO-TMT compensation disparity approaches. It stipulates the target group of the framework ("*Who?*"), the Switzerland-specific contextual factors to be taken into account for decisions relating to compensation disparity at the executive board level ("*What?*") and the rationale for the necessity of compensation disparity management ("*Why?*"). Figure 20 highlights the corresponding elements of the framework.
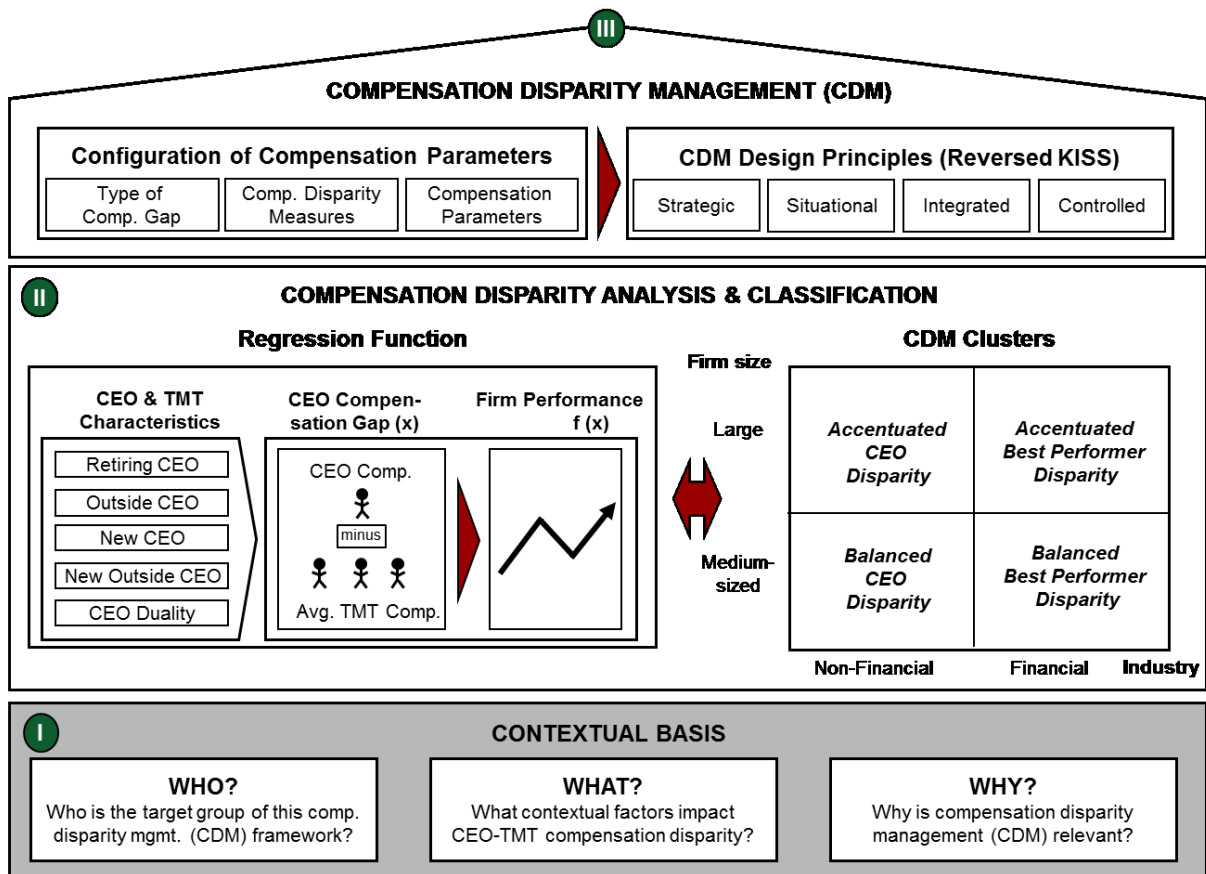
Figure 20: Contextual Basis of the CDM Framework

a) Who is the target group of the framework?

The CDM framework mainly addresses compensation policy-makers and compensation consulting firms of the following company target groups:

The *primary company target group* is given by the sample definition for the statistical analysis in this research work, and comprises SMI and SMIM listed companies. Those were chosen for the sample on the basis of comparatively good data availability with respect to compensation issues. However, it seems plausible that the primary target group may be extended to other Swiss medium-sized to large companies listed on the Swiss stock exchange. The argument for such an *extended company target group* is that the composition of the SMI and SMIM indices changes over the years due to varying market capitalizations and share turnover of the companies which constitute the selection criteria for the indices (SIX Swiss Exchange, 2013: 4). Especially on the level of the SMIM index, new companies may enter the primary target group, indicating that there are additional companies among the other stock market quoted

firms which are fairly comparable in terms of firm size. Therefore, the CDM framework should be applicable to those companies as well. Furthermore, large and medium-sized Swiss companies which are not stock-market listed or not listed in Switzerland might also profit from the insights presented in this framework. Figure 21 provides an overview of the primary and extended company target groups.

Primary Company Target Group   **Extended Company Target Group**

Country	Switzerland
Size	Medium-sized to large companies
Stock Exchange	• Publicly traded • SMI / SMIM members
Industry	• Basic Materials • Industrials • Consumer Goods • Healthcare • Consumer Services • Telecom • Financial Services • Technology • Oil & Gas

Medium-sized to large Swiss companies irrespective of stock market listing

Figure 21: Company Target Groups of the CDM Framework

b) What Switzerland-specific contextual factors need to be considered for CEO-TMT compensation disparity decisions?

Based on the qualitative literature research, the following contextual factors should be considered when taking decisions on CEO-TMT compensation disparity: i) Swiss culture, ii) Swiss compensation practices, and iii) Swiss regulations and corporate governance characteristics.

Some major points for each of these categories are recapitulated, explaining the relevance of the information provided in this respect in the previous theoretical chapters (cf. Chapter 2) by drawing inferences for the formulation of the CDM framework.[189]

i) Swiss Culture

Since research activities in the field of executive compensation focused on the United States, also tournament theory as one of the main theories relating to CEO-TMT compensation setting originated in the US (Lazear & Rosen, 1981). The main prediction of this theory is a positive association between compensation gap and firm performance which could also be shown for the Swiss sample companies of this research work. However, interpretation and derivations of these results cannot be made independently of the cultural context within which the results were generated, and the Swiss culture shows some significant differences to that of the United States.

Even though Switzerland and the United States score in about the same range for some cultural measures such as power distance (rather low) or performance orientation (very high), the manifestation of cultural values seems to be different: While the Swiss culture is relatively modest and low-key, the US culture approves visible differentiation and rewards for personal achievements.[190]

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[189] Firm size and industry also constitute relevant contextual factors, which are, however, not as Switzerland-specific as the factors discussed in this chapter. These two additional context factors will be discussed with respect to the company clustering process, in which they play an important role (cf. Chapter 4.2.3).

[190] As analyzed by Hofstede (1984) and the Globe study (Weibler & Wunderer, 2007; Hoppe & Bhagat, 2007).

This is also in line with the very high scores of the US with respect to Hofstede's individualism measure, for which the US has the highest value in the world. Furthermore, Tosi and Greckhamer (2004) had shown that in societies with a higher degree of individualism, also CEO compensation and the proportion of variable compensation tend to be higher,[191] traits of compensation systems typically to be observed in US firms. Thus, the internationalization process of the Swiss economy should not lead to the adoption of comparable CEO compensation sums and equally large variable compensation proportions as can frequently be observed in the US, since such compensation approaches are more suited to the US culture than to the Swiss culture. These cultural differences have to be kept in mind when deriving compensation disparity approaches for the different company clusters of the sample.

ii)   Swiss compensation practices

Relating to Swiss compensation practices, three major findings concerning compensation levels of the executive board members in Swiss companies and reference points used for the determination of their compensation sums will be reiterated:

High compensation levels: The Swiss compensation level is generally comparatively high for international standards (cf. Chapter 2.1.1). Thus, it can be argued that in order to set efficient tournament incentives, high executive compensation levels in Switzerland justify somewhat larger absolute CEO compensation gaps to keep up differentiation. Yet, this logic may not be applied to CEO compensation multiple, since it is a relative measure.

National compensation setting benchmarks: As shown by KPMG (2006), Swiss companies show a preference for country-adjusted pay approaches, meaning that compensation setting is oriented to other Swiss companies. Only the compensation sums of few Swiss companies are directly influenced by the high US compensation levels via the use of US compensation benchmarks. As noted by KPMG (2006: 3),

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[191] Compare Chapter 2.1.3 for a more detailed discussion of cultural differences between Switzerland and the United States.

this also underlines that the international market for managerial talent does not significantly impact management compensation levels.

Companies of comparable size as compensation setting benchmarks: Swiss compensation practices reflect the use of benchmarks of compensation in firms of comparable size (KPMG, 2006: 5). The correlation analysis of this dissertation also showed positive correlations between firm size and the three compensation variables.[192] This indicates that higher firm size goes along with higher CEO and TMT compensation, as well as higher CEO compensation gaps. Such larger CEO compensation gaps are justified when it comes to a tournament theory mindset. This is because CEO compensation gap should be larger at higher compensation levels which are proportionate to the increase in firm size, in order to keep up a notable degree of compensation differentiation among the CEO and the other executive board members.

iii) Swiss regulations and corporate governance characteristics

With regard to Swiss regulation, the Minder initiative is briefly discussed and relating to Swiss corporate governance, Swiss specifics of CEO duality are reviewed.

Minder Initiative: The recently accepted referendum to prevent abusive compensation sums is still to be translated into concrete legislation, upon which its effects will depend. However, due to its content such as binding voting of shareholders on management compensation sums and prohibition of compensation in advance or determination pay (cf. Chapter 2.1.1), it can be expected to have a significant impact on executive compensation setting in Swiss publicly traded companies in the years to come.

CEO Duality: As mentioned earlier, CEO duality is quite common in the US but occurs much less frequently in Switzerland (cf. Chapter 3.2.2). Besides to some degree altering the interpretation of the moderating variable DUAL in the regression analyses of this dissertation, compensation disparity management in cases of CEO duality needs to be dealt with on an individual basis, adapting the recommendations of

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[192] The negative correlation coefficient of TMTCOMP is again due to the variable transformation applied to the original TMT compensation values. For further details compare Chapter 3.2.3.

the CDM framework accordingly, since CEO duality in the Swiss company target group of the CDM framework is more an exception than the rule.

c) Why is CEO-TMT compensation disparity important?

The main arguments for the necessity of CEO-TMT compensation disparity management are threefold (cf. Chapter 1.2.2):

i)   *Financial argument*

Having a very high CEO compensation sum, and subsequently a large CEO compensation gap in place, but not generating an equivalent firm performance, constitutes a financial inefficiency. By overcompensating the CEO, profit is taken away from the shareholders without being justified by a reward in form of increased firm performance. The costs incurred from excessive management compensation sums may reach significant levels (Ethos, 2013: 65; Bebchuk & Grinstein, 2005: 297).

ii)   *Motivational argument*

While the size of CEO compensation gaps is discussed in this research work mainly with respect to its effects on TMT motivation, the motivational effects of overcompensation at the top of the organization may be as important to the employees further down the corporate ladder. Overcompensation at the top of the organization may entail feelings of being treated unfairly within the group of lower ranking employees which in turn might impair their motivation at work (cf. Chapter 2.2).

iii)   *Reputational argument*

Public awareness of compensation sums at the executive board level as well as accompanying pressure of shareholders to justify these compensation sums increases. At companies' annual general meetings, compensation reports are frequently a highly contested topic which subsequently receives wide media coverage. Consequently, *"an inappropriate remuneration system constitutes an important reputational risk"* (Ethos, 2013: 65).

4.2.3 Compensation Disparity Analysis and Classification

After having discussed the contextual factors to be considered, this chapter explains the process of deriving company clusters with different types of compensation disparity approaches. The procedure is divided into a general compensation disparity analysis a), and the subsequent deduction of company clusters with specific CDM approaches b).
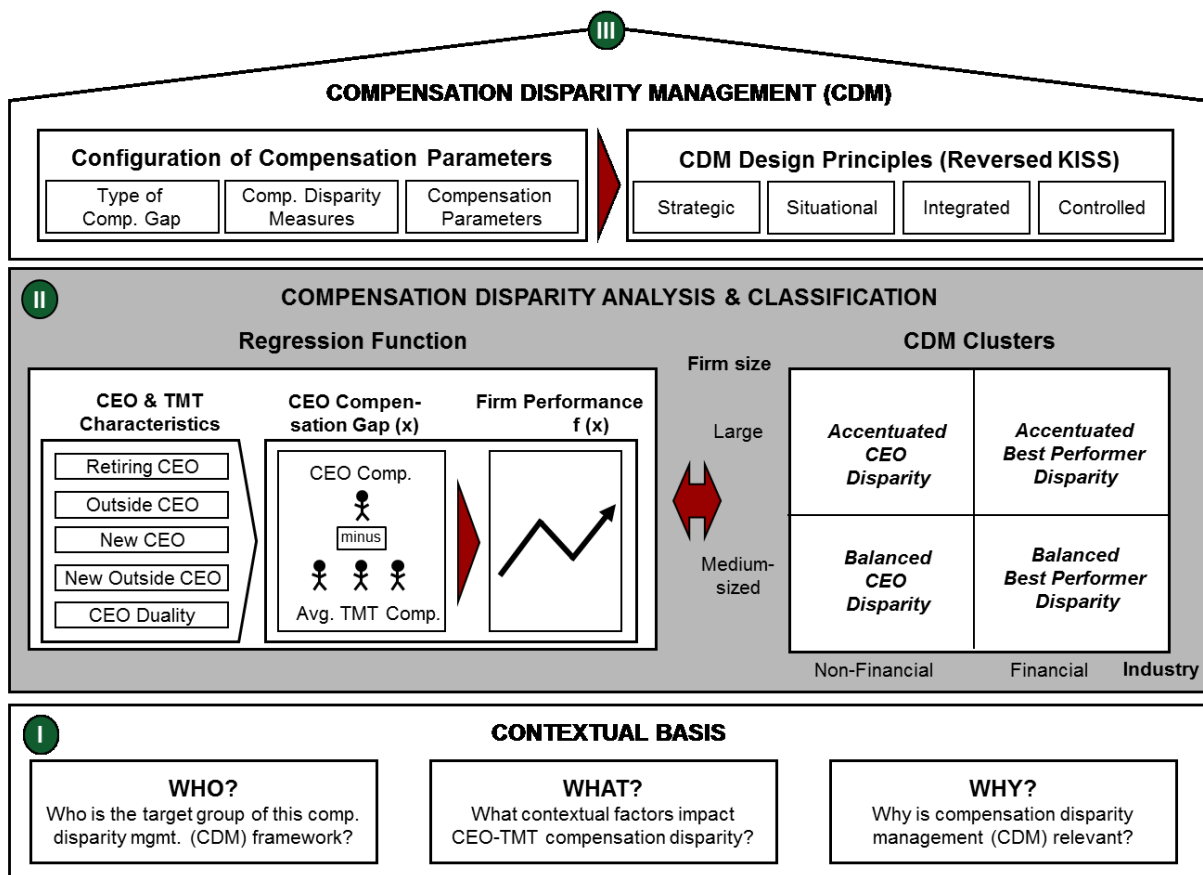
Figure 22: Compensation Disparity Analysis and Classification

a) General Compensation Disparity Analysis

The basis for compensation disparity analysis in this research work is provided by the main regression function of the quantitative empirical part (cf. Chapter 3.3). It tests whether and how CEO compensation gap is generally associated with firm performance. This cannot be judged by simply comparing the absolute value CEO compensation gaps installed within the sample companies with their firm performance since compensation is not the only factor that might influence firm performance and

since absolute value CEO compensation gaps are equally influenced by other factors such as firm size. In line with this, assigning a tournament theory or equity theory compensation approach to a company based on its CEO compensation gap would involve the question of what absolute CEO compensation gap corresponds to which pay disparity theory. This, however, depends on company characteristics such as firm size and complexity which may impact the compensation level of a firm and consequently the absolute compensation gap. However, the use of regression analysis makes it possible to control other influencing factors linked to CEO compensation gap and firm performance, and to test whether there is a general relationship that holds for the overall sample.

The association resulting from the multiple regressions of firm performance on CEO compensation gap was clearly positive (cf. Chapter 3.3.2), which is in line with tournament theory predictions. Furthermore, several hypotheses based on moderating variables were tested (cf. Chapter 3.3.3) which were formulated assuming again that tournament theory propositions hold. However, out of five moderating variables tested, only one (DUAL) showed a significant association as predicted by tournament theory, while two other significant moderating variables (RETCEO and OUTCEO) had coefficients with opposite signs to those predicted by tournament theory. Furthermore, the negative coefficient of DUAL might even be explained by other arguments (cf. Chapter 3.5). Consequently, it seems that the argument of tournament theory does not fit the data. So how might the discrepancies be accounted for, since none of the other two compensation disparity theories by itself may explain the results owing to the clearly visible tournament theory elements?

Compensation setting in practice clearly reflects some team player theory components. As proposed by team player theory, the company best practice examples show that compensation sums are linked to the performance of the entire company, for example through the influence of share-based variable compensation components (cf. Chapter 2.3.2). The knowledge thereof might motivate executives to behave cooperatively, if maybe only to maximize their own compensation payouts. Furthermore, the literature review with respect to Swiss cultural traits yields some additional evidence for the suitability of team player theory to the Swiss context, or

even aspects of equity theory: The Swiss culture is characterized as a very performance-oriented culture, but at the same time team orientation, modest manners and the willingness to find consensus are of high importance, too (cf. Chapter 2.1.3). Overall, these observations are in line with the argument by Hilb (2006) that classical tournament theory pay setting works *"for a society in which many people dream about becoming the president of an organization"* (129) which rather seems to be the case in the US than in Switzerland.

Consequently, in order to describe a suitable compensation disparity approach based on the insights gained in this research work, different elements of the three compensation disparity theories have to be extracted and combined. The proposed combined approach should take into account the positive link between CEO compensation gap and firm performance as a starting point and as the main tournament theory aspect, since the regression analysis has shown that firm performance increases along with CEO compensation gap. It should further draw on team player theory for realistically explaining how pay setting influences the propensity to cooperate among the TMT members. Additionally, the configuration of the approach needs to be adapted to take into account specific Swiss details. This results in a general mixed theory approach with tournament theory, team player theory and equity theory ideas.

b) Clustering Process

To provide a more differentiated characterization of the proposed theory, the sample companies are clustered into four groups based on a quantitative comparison of their characteristics and the accompanying CEO compensation gaps, as well as theoretical arguments. For each company cluster, a tailored compensation disparity approach will be developed (Chapter 4.2.4).

Industry sector (financial sector versus non-financial sector) and firm size (large versus medium-sized companies) were selected as the two main clustering dimensions. They will be discussed in the following.

Dimension 1: Industry Sector (Financial Sector versus Non-Financial Sectors)

In the process of compiling the sample, mainly observations of banks and other financial sector companies had to be excluded due to the fact that other executive board members instead of the CEO were the highest paid top managers. This shows that it is not unusual in financial sector companies that other executives earn more than the CEO. The existence of this possibility is rather covered through team player theory than through tournament theory since team player theory does not prescribe that the CEO has to be the highest earning executive board member.

Overall, this observation indicates that there seem to be differences in the compensation approach within the financial sector relative to other industrial sectors. The existence of such differences in compensation approaches is furthermore underlined, for example by the fact that in 2009 and 2010, SMI listed banks displayed significantly larger proportions of variable pay than other comparable-sized SMI firms (Ethos, 2011: 21).[193]

Dimension 2: Firm Size (Medium and Large)

Why was firm size selected as the second clustering dimension? The goal was to find a differentiation characteristic which explains differences in the size of CEO compensation gaps. The correlation analysis (cf. Chapter 3.2.3) of the sample companies revealed that two important aspects were positively correlated with the size of CEO compensation gaps – firm size and number of TMT members. The positive correlation between *firm size* and CEO compensation gap implies that the bigger a firm is, the larger tends to be its absolute value CEO compensation gap. This in turn is due to the fact that compensation levels are positively linked with firm size (and thus, even in case of similar CEO compensation multiples, larger firms tend to display higher CEO compensation gaps). The positive correlation between CEO compensation gap and the *number of TMT members* is in accordance with tournament

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[193] Compare Chapter 2.1.1 for further differences in compensation practices of financial versus non-financial sector companies.

theory propositions that a larger number of contestants require a higher reward for the winner to keep up motivation (cf. Chapter 2.2.1).

Furthermore, an additional qualitative review of the sample companies indicated that company size also tends to be positively linked with the *internationality of the executive board* (i.e. the number of non-Swiss executives on the executive board). This could also constitute a clustering dimension since having more international executives on the management board might necessitate a more international compensation setting approach.

Of these variables, company size appears to be the most inclusive variable that drives the value of the other variables: Larger companies tend to employ a higher number of TMT members, which is supported by the significant and relatively strong positive correlation of 0.45 for firm size and TMTCOUNT for the sample used in this study (cf. Chapter 3.2.3). As noted before, compensation levels of the executive board (along with CEO compensation gap) tend to be higher for larger firms, also reflected in the significant and positive correlations of approximately 0.40 for firm size and the three compensation measures (CEOCOMP, TMTCOMP and TOTALGAP; cf. Chapter 3.2.3). Furthermore, the author assumes that larger companies also tend to install more international executive boards.[194]

Since the increase in company size and the accompanying increase in CEO compensation gap is gradual, the delimitations of what are to be considered as large- or medium-sized companies are only approximate guidelines. It is oriented to the definition employed by SIX Swiss Exchange which roughly characterizes SMI firms as large companies, whereas SMIM firms and the remaining firms of the largest 100 (usually Swiss-based) companies quoted on the Swiss exchange are labeled medium-sized companies[195] (cf. SIX Swiss Exchange, 2013). Figure 23 shows the clusters

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[194] Romer (2009: 166), for example, calculated a significant and positive correlation of about 0.4 for the size of the board of directors with internationality of the board members in Swiss market-listed firms.

[195] However, this definition is fluid as the values of the ranking criteria (i.e. liquidity and market capitalization) are subject to constant change.

derived for these two clustering dimensions and the associated compensation disparity approaches:
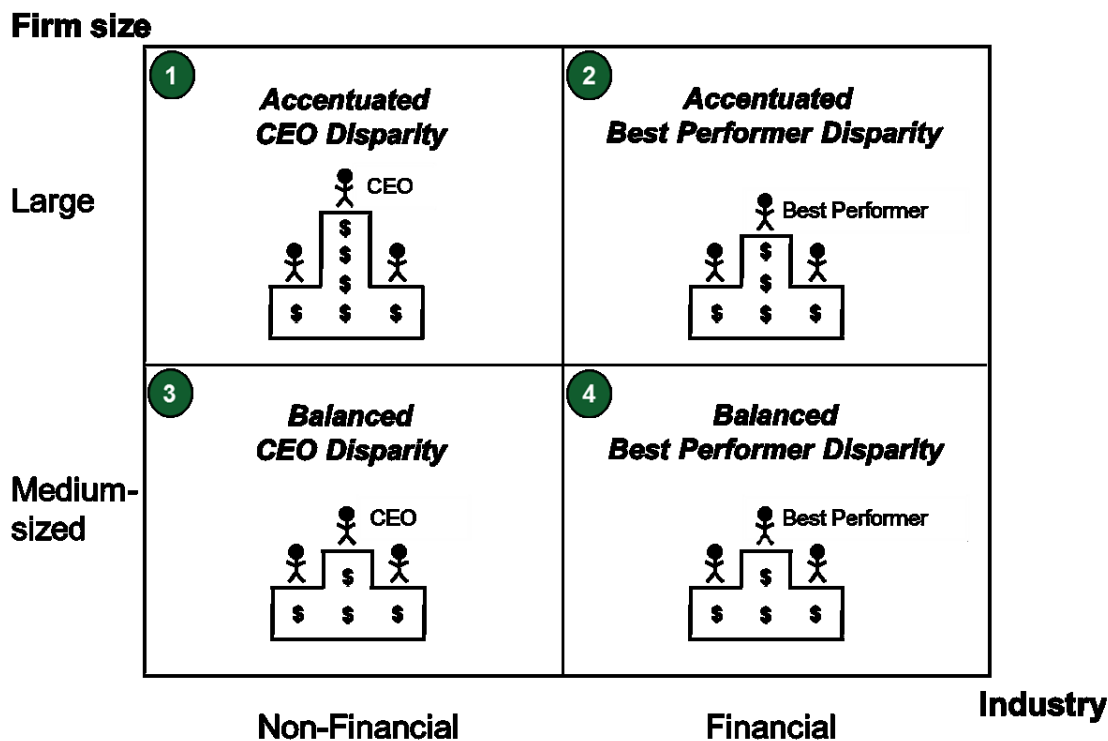
Figure 23: Clustering Dimensions of CDM Company Clusters

Cluster 1: Accentuated CEO Disparity

This approach has its roots in tournament theory. It proposes a hierarchical executive compensation approach with the CEO as the highest paid person within the executive board. For this approach, notable compensation differences between hierarchical levels, i.e. between the CEO and the TMT members, are suggested which are larger than marginal product differences. Therefore, this approach is called "accentuated" CEO disparity model. The target companies of this approach are primarily large non-financial companies.

Cluster 2: Accentuated Best Performer Disparity

This approach contains some team player theory elements and secondary tournament theory aspects. The team player theory elements relate to the fact that the compensation distribution at the executive board level does not have to be strictly

hierarchical, but also non-CEOs might be the highest paid person of the executive board. Thus, this approach is rather focused on rewarding best performers, and thus better accommodates the integration and motivation of other non-CEO managerial talents. Furthermore, it refers to team player theory as larger CEO compensation gaps do not automatically have to go along with higher firm performance, but may be grounded on individual performance differences. The tournament theory aspects are related to the potential size of compensation differences, which may be larger than estimated marginal products and larger than in the balanced version of the best performer disparity approach. The Accentuated Best Performer Disparity approach aims at large financial sector companies as these have already shown an affinity for executive compensation models with non-CEO highest paid managers.

Cluster 3: Balanced CEO Disparity

The Balanced CEO Disparity approach is basically a hierarchical compensation distribution with the CEO as the highest paid member of the executive board. However, in contrast to the approach presented for the companies in cluster 1, i.e. Accentuated CEO Disparity, the balanced version displays more moderate compensation differences between the CEO and the TMT members, more in the style of team player theory-like orientation to marginal product differences or equity theory-like ideas of smaller compensation differentials. As a result, compensation distribution within the executive board is more "balanced." This approach is primarily recommended for medium-sized companies which do not belong to the financial sector.

Cluster 4: Balanced Best Performer Disparity

The Balanced Best Performer Disparity approach combines ideas of team player theory and equity theory. Following team player theory, the CEO does not necessarily have to be the highest paid member of the executive board, but compensation setting allows for other top managers to earn more than the CEO, depending on individual performance. Consequently, the size of compensation differences does not need to be linked with firm performance, but may also mainly reflect individual performance and marginal product differences. Yet, resulting compensation differences should be

moderate, thus, corresponding to marginal product differences or taking into consideration equity theory ideas. The Balanced Best Performer Disparity approach aims at medium-sized financial sector companies.

Figure 24 illustrates the characterizing factors of the four cluster-specific compensation disparity approaches. The implementation of these proposed CEO-TMT compensation disparity approaches will be the topic of the following chapter.
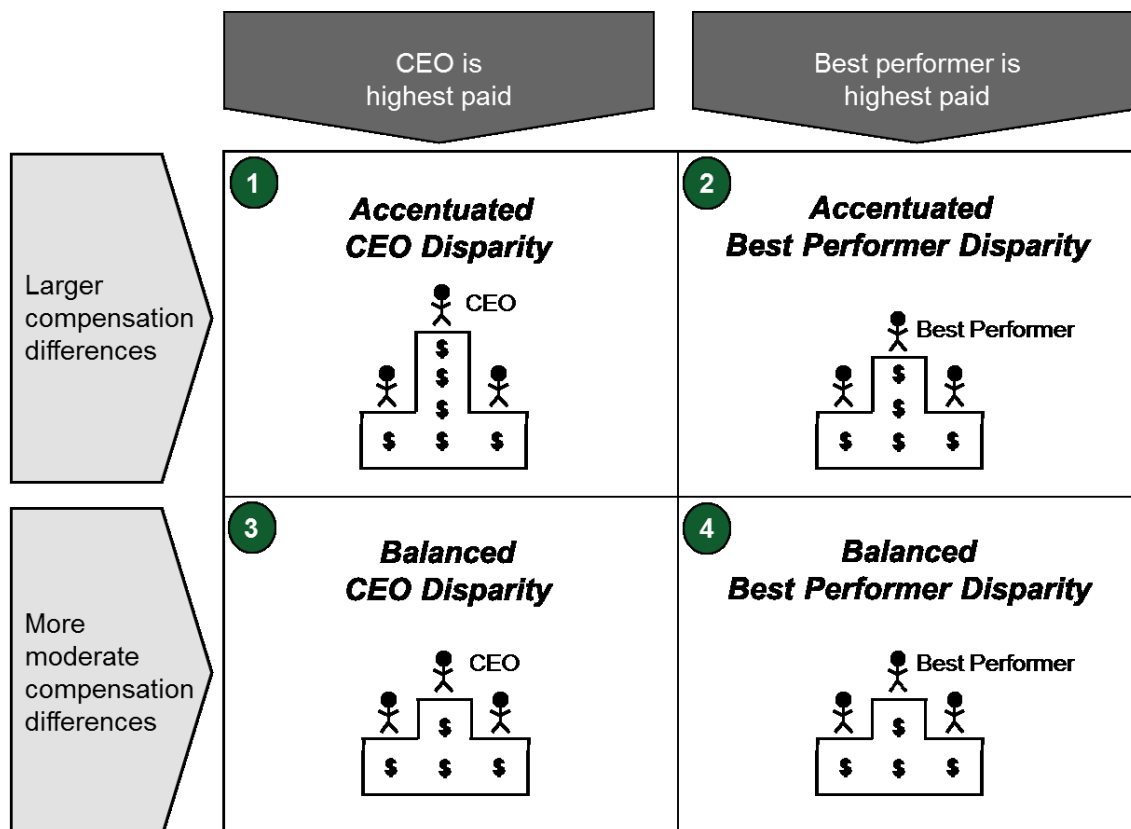
Figure 24: Characterization of Cluster-Specific CDM Approaches

4.2.4 Compensation Disparity Management

This chapter is concerned with the explanation of firm cluster-specific compensation disparity implementation of the approaches derived in the previous subchapter (cf. Figure 25). It ends with the formulation of general compensation disparity management principles based on the reversed KISS-structure by Hilb (2005: 7).

The recommendations are based on own analyses and reflections, as well as on those elaborated by shareholder associations and researchers.
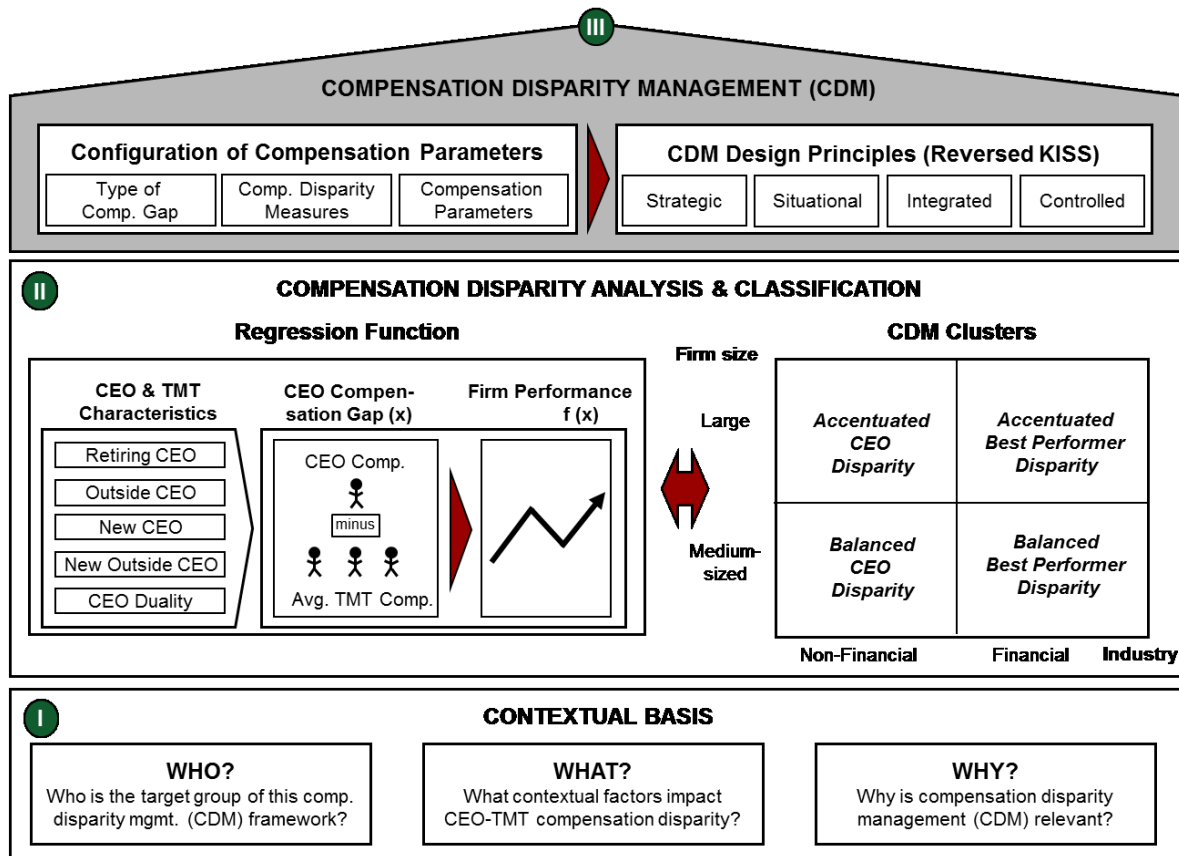
Figure 25: Compensation Disparity Management (CDM)

The quantitative analysis in Chapter 3 is based on CEO compensation gap, as this is a widely used concept to measure CEO-TMT compensation differences and is well suited to the regression analyses in which other factors that influence compensation level or firm performance (such as firm size) were also controlled. For the purpose of compensation disparity management, however, the levels of compensation disparity between the CEO and the TMT are measured primarily through CEO compensation multiple. The advantage of CEO compensation multiple is that it is a relative measure that sets CEO compensation and the average compensation of the TMT members in relation, thus abstracting from the overall compensation level of the executive board within a company. In contrast, CEO compensation gap is an absolute figure, which consequently increases with compensation levels, even though the relation of CEO compensation to average TMT compensation (excl. CEO) may remain unchanged. Therefore, CEO compensation multiple plays an important role in this chapter as it allows of indicating approximate recommended values for compensation disparity irrespective of absolute top executive pay level.

a) Cluster-specific CDM Implementation Paths

CEO-TMT compensation disparity constitutes the central aspect of the CDM framework. Yet, CEO compensation multiple as a measure of CEO-TMT compensation disparity cannot be set irrespective of factors that influence the absolute compensation sums (compensation configuration parameters), e.g. the percentage of fixed versus variable compensation. Consequently, such compensation configuration parameters need also to be discussed in this chapter, even though the CEO compensation gap and respective CEO compensation multiple remain the superordinate concepts.

In this connection, the company clusters derived in Chapter 4.2.3 are picked up again and cluster-specific implementation paths for CEO-TMT compensation disparity management are developed which provide reference points for some of the relevant compensation configuration parameters (cf. Table 38). These implementation paths are supposed to serve as a starting point for concrete CEO-TMT compensation disparity design, but are certainly meant to be subject to case-specific adaptations and involve a substantial degree of subjectivity since setting limits cannot be based solely on factual knowledge, but almost always includes a notable extent of personal judgment. Therefore, greater importance will be attached to the underlying considerations than to the actually proposed figures that rather reflect potentially resulting implementation paths instead of "implementation manuals."

Table 38 differentiates between three elements of the implementation paths: i) type of compensation gap, ii) compensation disparity measures, and iii) configuration parameters. These will be used to structure the explanations regarding the practical implementation below.

#	Approach	Type of Comp. Gap	Compensation Disparity Measures		Configuration Parameters	
		Highest Paid (HP) Person	(CEO) Compensation Multiple	(CEO) Compensation Gap	On Target % of CEO Variable Compensation	On Target % of TMT Variable Compensation
1	*Accentuated CEO Disparity*	CEO	Max. ~3	CEO compensation gap > marginal product differences	~60%	~50%
2	*Accentuated Best Performer Disparity*	CEO not necessarily the HP	Max. ~1.5	Compensation gap > marginal product differences	~50%	~50%
3	*Balanced CEO Disparity*	CEO	Min. ~1.1 - max. ~2.3	CEO compensation gap oriented at marginal product differences	~40%	~30%
4	*Balanced Best Performer Disparity*	CEO not necessarily the HP	Max. ~1.3	Compensation gap oriented at marginal product differences	~30%	~30%

Table 38: Basic Implementation Paths for CDM Company Clusters

i) Type of Compensation Gap

The type of compensation gap refers to the question whether the CEO needs to be the highest paid member (HP) of the executive board, which has already been addressed briefly in the introduction to the cluster-specific CDM approaches in Chapter 4.2.3. While for the Accentuated CEO Disparity approach (Approach 1) and the Balanced CEO Disparity approach (Approach 3), which are hierarchical compensation approaches, the CEO has to be the highest paid top manager, this does not need to be the case for the Accentuated Best Performer Disparity approach (Approach 2) and the Balanced Best Performer Disparity approach (Approach 4), both of which draw on team player theory in this respect since they do not require the CEO to be the highest paid member of the executive board.

As a result, when calculating compensation gaps as the compensation of the highest paid member of the executive board minus the average compensation of the other executive board members (potentially incl. the CEO), compensation gaps for the Accentuated CEO Disparity approach and the Balanced CEO Disparity approach represent CEO compensation gaps, whereas compensation gaps for the Accentuated Best Performer Disparity approach and the Balanced Best Performer Disparity approach may be CEO compensation gaps, but could as well be compensation gaps between a non-CEO highest paid top manager and the other top managers (incl. the CEO). However, the terms "CEO compensation gap" and "CEO compensation multiple" will still be used in the following for the sake of convenience, even though these terms might implicitly comprise potential "best performer compensation gaps" or "best performer compensation multiples" as well for cases when the CEO is not the highest paid member of the executive board.

ii)   *Compensation Disparity Measures*

In terms of compensation disparity measures, it will be discussed why setting an upper limit to compensation disparity may be beneficial. Subsequently, reference points for the size of compensation multiples and gaps will be specified.

Argument for an upper limit of compensation disparity within the executive board: The major insight into compensation disparity management is that CEO compensation multiple needs an upper limit.[196] The application of an upper limit to CEO compensation multiple also implies an indirect upper limit to absolute CEO compensation gaps. The following section will give the rationale for this recommendation.

The author of this dissertation performed additional regressions to analyze the relationship between CEO compensation multiple (instead of CEO compensation gap) and firm performance (cf. App. 16). For the overall sample, the regression showed a

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[196] However, this is not to be confused with such upper limits as demanded by the Swiss referendum "1:12 – for fair wages," since CEO compensation multiple does not refer to the relation of the highest paid to the lowest paid employee, but pay ratios within the executive board.

positive relationship which was significant for both ROE and ROA. When dividing the sample into firms with a CEO compensation multiple below the mean and those with a CEO compensation multiple above the mean, the positive relationship between CEO compensation multiple and firm performance remains robust for the regressions of ROE and ROA based on the sample of firms with a lower CEO compensation multiple, but did not yield significant results for a relationship between CEO compensation multiple and performance of firms in which the CEO compensation multiple was above the mean.[197] This indicates that at some point, CEO compensation multiple loses its association with firm performance, which means CEO compensation sums are probably too high with respect to average compensation sums of the other executive board members to be justified by performance arguments. While a non-existent association between CEO compensation multiple and firm performance is in line with team player theory, this theory, in its strict form, does not seem to be appropriate in this case, as CEO compensations are evidently too large to be justified by marginal product differences, considering the extreme CEO compensation multiples of 5 to 9 which are to be calculated for 10% of the observations.

Consequently, also bearing in mind financial, reputational, and fairness arguments, CEO compensation multiple needs an upper limit, since such enormous multiples do not seem to create equivalent value with respect to firm performance, and thus, lack justification.[198] This proposition has also been recently formulated by Ethos, stipulating that *"the difference in remuneration between the CEO and other senior*

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[197] For MTB, the regressions on CEO compensation multiples did not yield any significant results, neither for the basic sample of 166 observations, nor for the subsamples. The results for ROE and ROA also hold when regressing these subsamples on CEO compensation gap instead of CEO compensation multiple (not shown).

[198] The argument that enormous CEO compensation sums are necessary to retain talented CEOs who would otherwise leave the company is challenged by Elson and Ferrere (2013). They note regarding the situation in the US that *"more often than not, the CEOs of large public companies are long-time insiders rather than the more recognized external hires. The operation of a successful business requires intimate knowledge of its operations that goes beyond the simple, general management talent that can be transferred from company to company. The data show that companies hire a CEO from outside only when forced to by poor performance or changing industry structures that necessitate a dramatic turnaround, restructuring, or sale"* (2). They further argue that CEOs recruited from outside under such circumstances are seldom CEOs of other companies, but rather their direct reports, and that CEOs do not have much of a chance to gain the CEO position at another big company, making such job changes an exception.

executives should be limited, as should be the gap between senior executive pay and that of those lower down the corporate ladder" (Ethos, 2013: 68).

Having discussed the rationale for limits to compensation disparity within the executive board, the following paragraphs will outline potential values for such limits.

CEO Compensation Multiple: CEO compensation multiples are more independent of firm size than CEO compensation gaps. As a result, they have greater applicability when it comes to indicating concrete numbers. However, the major difficulty of both CEO compensation multiple and CEO compensation gap is that they cannot be set in advance, but depend on the degree of target achievement due to the variable compensation component. Thus, factors like firm performance (which is supposed to determine variable CEO compensation), as well as business unit performance and individual performance of the TMT members may have an influence on the resulting CEO compensation multiple. Consequently, a firm's board of directors can only specify a range for CEO compensation multiple in advance based on simulating possible outcomes under certain compensation designs. These should include best case and worst case scenarios, in order to define a lower and upper limit of potential CEO compensation multiples.[199]

Given these constraints, what value of CEO compensation multiple constitutes a reasonable upper limit? The regression analyses showed that the positive relationship between CEO compensation multiple and firm performance does not hold for subsamples with CEO compensation multiples above the mean of the basic sample. However, the positive association does hold for samples with multiples below the mean. Therefore, this constitutes the starting point. The mean CEO compensation multiple amounts to approximately 2.7, while the median CEO compensation multiple is 2.3, indicating that the distribution is positively skewed (cf. App. 15). Consequently, the largest CEO compensation multiples are definitely considered beyond the upper limit.

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[199] Calculating scenarios in company practice involves estimating individual compensation outcomes for the different executive board members instead of merely estimating an average TMT compensation sum as performed in this research work due to lack of published data on individual compensation sums.

The author of this thesis agrees with Elson and Ferrere's (2013) comment on this issue: *"the bias should be toward lower pay. Executive disappointment can be managed by the board, but the damage to employee morale and motivation caused by excessive CEO compensation is far more difficult to resolve"* (5). Consequently, a maximum CEO compensation multiple of around 2.3 (median) is proposed for the case when executives reach their performance targets. For cases when the CEO outperforms the targets, whereas the direct reports do not reach their targets and get the lowest payout possible, the maximum CEO compensation multiple should still not transcend the limit of 3, which is a certain degree above the mean.

Table 38 provides reference points for CEO compensation multiples which are in line with the cluster-specific compensation disparity approaches. The maximum CEO compensation multiple values refer to those multiples that should not be exceeded in a scenario in which e.g. the CEO (or highest paid TMT member) has the best possible compensation outcome, whereas the average variable TMT compensation reaches the lowest possible point (even though this combination does not seem very likely).

For compensation disparity Approach 1 (Accentuated CEO Disparity), the maximum value for CEO compensation multiple is set at 3. This is because tournament theory envisages a positive association of CEO compensation gaps with performance, and this relationship holds for the subsample with multiples lower than the mean.[200] Consequently, the maximum value of the multiple was set at 3 which is a little higher than the mean.[201]

For the Balanced CEO Disparity approach, the multiple should lie between 1.1 and 2.3 which is lower than that for the Accentuated CEO Disparity approach as a reflection of the underlying complementary equity theory considerations.

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[200] The exact value of the mean is 2.66.

[201] A CEO compensation multiple of 3 may seem exorbitant at first sight. However, it is put into perspective to some degree when reasoning that this does not necessarily constitute the compensation gap between the CEO and the next highest earning top manager, but the TMT compensation sum used in the calculation of the CEO compensation multiple constitutes an average of several top managers. Nevertheless, a multiple of 3 still represents a very large compensation disparity.

The minimum value is indicated in order to ensure the existence a CEO compensation gap, whereas the maximum value constitutes the median of the sample companies. Hence, CEO-TMT compensation disparity measured by CEO compensation multiple is situated at the present lower end of the sample of this dissertation.

Both the Accentuated Best Performer Disparity approach and the Balanced Best Performer Disparity approach include team player theory elements insofar as compensation gaps do not need to be CEO compensation gaps. For the Accentuated Best Performer Disparity approach, compensation gaps may get somewhat larger than for the Balanced Best Performer Disparity approach which is more equity-oriented. Therefore, a maximum compensation gap of 1.5 is recommended for the Accentuated Best Performer Disparity approach, whereas for the Balanced Best Performer Disparity approach, the maximum should not go beyond 1.3 to incorporate the equity idea. These differences may seem marginal, but get substantial when transferred to absolute compensation gaps, especially when considering that the Accentuated Best Performer Disparity approach is supposed to apply to larger firms that tend to have notably higher executive compensation levels.[202]

The question now arises if the implementation of such limits is realistic and feasible. The company DuPont may be cited as a best practice example for the implementation of a CEO compensation multiple. In 1990, it developed a strict CEO compensation approach which was strongly oriented to internal equity (Woolard, 2005: 5). Edgar S. Woolard Jr., former DuPont CEO and Chairman of the Board, describes this CEO compensation approach as follows:

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[202] It may be questioned why lower compensation multiples are recommended for the Accentuated Best Performer Disparity approach (Approach 2) than for the Accentuated CEO Disparity approach (Approach 1), even though both are called "accentuated." This is explained by the different purpose of the approaches, as the Accentuated CEO Disparity approach aims at motivating through hierarchy, while Accentuated Best Performer Disparity is grounded on team player theory and based on the team idea, strong compensation differentiation is difficult to justify.

> *We're going to look at the people who run the businesses, who make decisions*
> *on prices and new products with guidance from the CEO - the executive vice*
> *presidents - and we're going to set the limit of what a CEO in this company can*
> *be paid at 1.5 times the pay rate for the executive vice president.* (Woolard,
> 2005: 5)

He goes on to describe this CEO compensation approach, which is based on the definition of a CEO compensation multiple, as equitable (Woolard, 2005: 6). This example shows that limits to CEO compensation multiple have already been successfully employed and willingly accepted by the CEO concerned.

CEO Compensation Gap: Since CEO compensation gaps as absolute values are closely linked with the compensation level of the executive board in a firm (which, in turn, is linked with firm size and complexity), these implementation guidelines do not give recommendations for its monetary size. Nevertheless, based on the underlying theoretical constructs, rough indications can be given of how the compensation gaps should relate to marginal products of the individual managers. For the Accentuated CEO Disparity approach and the Accentuated Best Performer Disparity approach, compensation gaps should be larger than marginal product differences due to their secondary tournament theory element, whereas for the Balanced CEO Disparity approach and the Balanced Best Performer Disparity approach, the aspect of equality should receive a higher value, thereby orienting compensation gaps more to marginal product differences. This should lead to lower compensation gaps, and hence, a more unbiased distribution.

iii)   Compensation Configuration Parameters

Since executive compensation sums contain a variable proportion that depends on firm performance and frequently also on individual performance, the size of CEO compensation gaps and multiples cannot be determined in advance. Besides being influenced by the fixed compensation sum of the CEO relative to the average fixed compensation sum of the TMT, they also depend on the proportion of variable compensation allotted to the CEO in relation to their total compensation, as well as compared to the variable compensation proportions of the other TMT members. These

variable compensation proportions for both the CEO and the TMT, in turn, depend on the degree of target fulfillment of these individuals. While ranges for the proportion of variable compensation in relation to fixed compensation can be set in advance, the degree of target fulfillment cannot be influenced after having fixed the targets (even though the board of directors can increase the probability of target fulfillment by setting less demanding targets [or vice versa] which, however, would not serve the interest of the firms' shareholders). Therefore, three important levers of CEO compensation gap were identified above:

- Proportion of variable compensation relative to total compensation of the CEO

- Proportion of average fixed compensation of the TMT relative to fixed compensation of the CEO

- Ratio of the average variable compensation proportion of the TMT relative to the variable compensation proportion of the CEO

These three levers will be discussed in detail below.

Proportion of variable CEO compensation: A comparative analysis of the sample companies showed that firms with very high CEO compensation gaps also tend to belong to those firms having very high proportions of variable CEO compensation to fixed CEO compensation.

The five SMI/SMIM firms with the highest CEO compensation gaps in the year 2010 and their corresponding proportions of fixed CEO compensation and average fixed TMT compensation are listed below.[203]

It can be seen that the companies with the highest CEO compensation gaps all had less than 25% of CEO fixed compensation which was only the case for overall 8 out

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[203] The year 2010 was chosen as this was the most recent year included in the sample used in this study. Holcim was eliminated from this overview of firms with the highest CEO compensation gaps, since its figures for the year 2010 were not representative. Owing to a very large pension fund contribution for the CEO in 2010, fixed CEO compensation was inflated to a point that the CEO even had an almost 8% higher proportion of fixed compensation than the other TMT members on average (cf. Ethos [2011] for details and split up of the underlying compensation figures).

of 48 firms in the SMI/SMIM sample for 2010 as indicated by Ethos (2011: 37–39).
Four of the firms with the highest CEO compensation gaps in 2010 also belonged to
the six companies with the highest CEO compensation multiples.

#	Company	CEO Comp. Gap	CEO Comp. Multiple	% of Fixed CEO Comp. (1)	% of Avg. Fixed TMT Comp. (2)	Delta % of (1) - (2)
1	Nestlé	8'965'180	3.65	24.80%	40.20%	15.40%
2	Novartis	8'013'692	2.63	13.30%	19.70%	6.40%
3	Lindt & Spüngli	6'731'670	4.19	21.00%	31.70%	10.70%
4	Julius Bär	6'354'526	4.99	13.20%	32.00%	18.80%
5	Temenos	6'238'891	4.72	13.30%	27.60%	14.30%

Table 39: SMI/SMIM Firms with Highest CEO Compensation Gaps in 2010[204]

Ceteris paribus, it can be assumed that capping the proportion of variable
compensation, e.g. by setting a minimum percentage of fixed compensation, would
consequently contribute to reduce the occurrence of very large CEO compensation
multiples, as well as extremely large CEO total compensation sums, assuming that
fixed CEO compensation sums remained unchanged.

To substantiate these findings, a sensitivity analysis for a hypothetical average SMI
company was calculated based on approximate average compensation figures of SMI
firms as indicated by PricewaterhouseCoopers (2012a) and Ethos (2012). The base
case assumes a variable proportion of CEO total compensation of 65%, a proportion
of average fixed compensation of the TMT to fixed CEO compensation of 55%, and a
ratio of TMT average variable compensation percentage to variable CEO
compensation percentage of 90%. Generally, lower or higher values of one parameter
may be compensated by adapting the remaining compensation parameters, so the
resulting CEO compensation multiple remains unchanged. For example, a higher
variable proportion of CEO compensation may either be compensated by
simultaneously increasing the proportion of average variable TMT compensation in

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[204] Source: based on Ethos (2011).

relation to the proportion of variable compensation of the CEO, or by increasing the ratio of average fixed TMT compensation to fixed CEO compensation.

The results of the sensitivity analysis propose a maximum limit of approximately 75% of variable CEO compensation with respect to CEO total compensation, as beyond this point, CEO compensation multiple increases very quickly with further increases in variable CEO compensation, [205] reflected in a notable steepening of the slope of the line in Figure 26. This applies to CEO compensation gap, too. Furthermore, the proposed limit also approximates a CEO compensation multiple of about 2.3 (i.e. the median of the SMI/SMIM sample used in this dissertation).

The findings accord with the observation made regarding the companies listed in Table 39 with the highest CEO compensation gaps in 2010: Fixed CEO compensation proportions below 25% tend to go along with large CEO compensation gaps.

The calculations for selected values of the sensitivity analysis are reported in Figure 26 below, with the base case marked by a frame. The variable that is altered as well as the CEO compensation multiple constituting the outcome variable is highlighted in grey. The figure also illustrates the calculated sensitivities, indicating the approximate location of the base case by a dashed line.

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[205] This does not apply to cases when the variable proportions of CEO and TMT remain equal. In that case, CEO compensation gap increases, but the multiple remains unchanged.

Sensitivity Analysis of Lever: **Variable Compensation Proportion of CEO**

CEO Compensation					Fixed Comp. TMT vs. CEO	% Var. Comp. TMT vs. CEO	Average TMT Compensation					Multiple
Fix		**Var.**		**Total**			**Fix**		**Var.**		**Total**	**x**
CHFm	%	CHFm	%	CHFm	%	%	CHFm	%	CHFm	%	CHFm	
2.4	70%	1.0	**30%**	**3.4**	**55%**	**90%**	1.3	73%	0.5	27%	**1.8**	**1.9**
2.4	60%	1.6	**40%**	**4.0**	**55%**	**90%**	1.3	64%	0.8	36%	**2.1**	**1.9**
2.4	35%	4.5	**65%**	**6.9**	**55%**	**90%**	1.3	41%	1.9	59%	**3.2**	**2.2**
2.4	20%	9.6	**80%**	**12.0**	**55%**	**90%**	1.3	28%	3.4	72%	**4.7**	**2.5**
2.4	10%	21.6	**90%**	**24.0**	**55%**	**90%**	1.3	19%	5.6	81%	**6.9**	**3.5**

Figure 26: Sensitivity Analysis for % of Variable CEO Compensation

These findings are also in line with the recommendations by Ethos (2013: 68) that variable compensation proportions of CEOs should not be larger than 75% of total compensation. Ethos (2013) further recommends that in case the targets are met, variable compensation should not amount to more than 150% of the fixed compensation of the CEO, and 100% of the fixed compensation of the other TMT members. Additionally, according to Ethos (2013), there should be a maximum limit to variable compensation for cases of outperforming the targets of "twice the on target component" (68). This translates into the following percentage figures (cf. Table 40):

	Proportions	
	Fixed Compensation	Variable Compensation
CEO		
On target performance	40%	60%
Above target performance	Minimum of 25%	Maximum of 75%
TMT		
On target performance	50%	50%
Above target performance	Minimum of 33.3%	Maximum of 66.6%

Table 40: Recommended Proportions of Fixed and Variable Compensation[206]

Yet, contributing to the reduction in the potential size of CEO compensation gaps or multiples is not the only objective of such limits on variable proportions in relation to fixed compensation. Glass Lewis & Co. (2013), a company focused on governance analysis and proxy voting, justifies the call for a substantial proportion of fixed compensation and limits to the proportion of variable compensation with the objective "*to minimize the incentives for excessive risk-taking and allow for a fully flexible bonus policy*" (15). The author of this dissertation agrees that the proportion of variable compensation should reflect such factors as risk management considerations, but simultaneously, the chosen compensation disparity approach of a company should also be taken into account.

Thus, what can be inferred for the practical configuration of cluster-specific compensation approaches with respect to variable versus fixed CEO compensation proportions? In Table 38, recommendations for the split-up of CEO and TMT total compensation into a fixed and variable proportion are given for each compensation disparity approach. For the CEO-focused approaches (Accentuated CEO Disparity and Balanced CEO Disparity), an unequal proportion of variable compensation is

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[206] Source: based on Ethos (2013: 68).

recommended for the CEO and the average TMT compensation, with a slightly higher variable proportion for the CEO. This serves to support the positive relationship between CEO compensation gap and firm performance, as the unequal proportions of variable compensation ensure that CEO compensation is more susceptible to firm performance changes and thus, profits more from good performance than TMT compensation which has a lower variable proportion. In contrast, the best performer compensation disparity approaches (Accentuated Best Performer Disparity and Balanced Best Performer Disparity) stipulate rather equal proportions of variable compensation for both CEO and TMT, to ensure that good firm performance does not overly push CEO compensation in relation to average TMT compensation.

Concretely, the maximum variable compensation proportions in relation to fixed compensation proportions recommended by Ethos are attributed to the Accentuated CEO Disparity approach, with an on-target proportion of variable CEO compensation of 60% and an on-target variable TMT compensation of 50%. For the Balanced CEO Disparity approach, the recommended percentages are slightly lower with an on-target variable proportion of 40% for the CEO and 30% for the other TMT members. Due to these lower variable proportions of total compensation in comparison to the Accentuated CEO Disparity approach, the Balanced CEO Disparity approach is thought to incorporate the equity aspects, as a higher proportion of fixed compensation leaves less room for extreme compensation differentiation via vast variable compensation proportions. To sum up, the reduced variable compensation proportion for both CEO and TMT in the Balanced CEO Disparity approach versus the Accentuated CEO Disparity approach aims to lower the maximum potential CEO compensation multiple.

This line of argument may also be applied to the Accentuated Best Performer Disparity approach and the Balanced Best Performer Disparity approach: For the Accentuated Best Performer Disparity approach, an equal fixed and variable compensation proportion of 50% is envisaged for both the CEO and the TMT, whereas the lower variable compensation proportion of 30% for both CEO and TMT in the Balanced Best Performer Disparity approach serves to limit the potential increase in CEO compensation multiple (since even at equal variable proportions for

the CEO and the TMT, the CEO would often profit more in absolute terms from better firm performance as a result of the mostly higher fixed compensation sums).

Proportion of average fixed compensation of TMT relative to fixed compensation of CEO: Additionally, the fixed compensation of the CEO and the average fixed compensation of the TMT members have to be considered. The importance is grounded on the fact that the calculation of variable compensation proportions makes reference to fixed compensation. Thus, in cases of very low average fixed TMT compensation relative to fixed CEO compensation, a certain variable CEO compensation proportion (e.g. of 65%) leads to a much higher CEO compensation multiple than for a higher ratio of average fixed TMT compensation over fixed CEO compensation. This is illustrated in the calculation examples for different proportions of average fixed TMT compensation sum to fixed CEO compensation sum in Figure 27. The base case is again marked by a frame and the variable which is altered (i.e. fixed compensation TMT over fixed compensation CEO) and the resulting CEO compensation multiple are highlighted in grey.

CEO Compensation					Fixed Comp. TMT vs. CEO	% Var. Comp. TMT vs. CEO	Average TMT Compensation					Multiple
Fix		**Var.**		**Total**			**Fix**		**Var.**		**Total**	**x**
CHFm	%	CHFm	%	CHFm	**%**	%	CHFm	%	CHFm	%	CHFm	
2.4	35%	4.5	65%	**6.9**	**20%**	90%	0.5	41%	0.7	59%	**1.2**	**5.9**
2.4	35%	4.5	65%	**6.9**	**40%**	90%	1.0	41%	1.3	59%	**2.3**	**3.0**
2.4	35%	4.5	65%	**6.9**	**55%**	90%	1.3	41%	1.9	59%	**3.2**	**2.2**
2.4	35%	4.5	65%	**6.9**	**80%**	90%	1.9	41%	2.7	59%	**4.6**	**1.5**
2.4	35%	4.5	65%	**6.9**	**90%**	90%	2.2	41%	3.0	59%	**5.2**	**1.3**
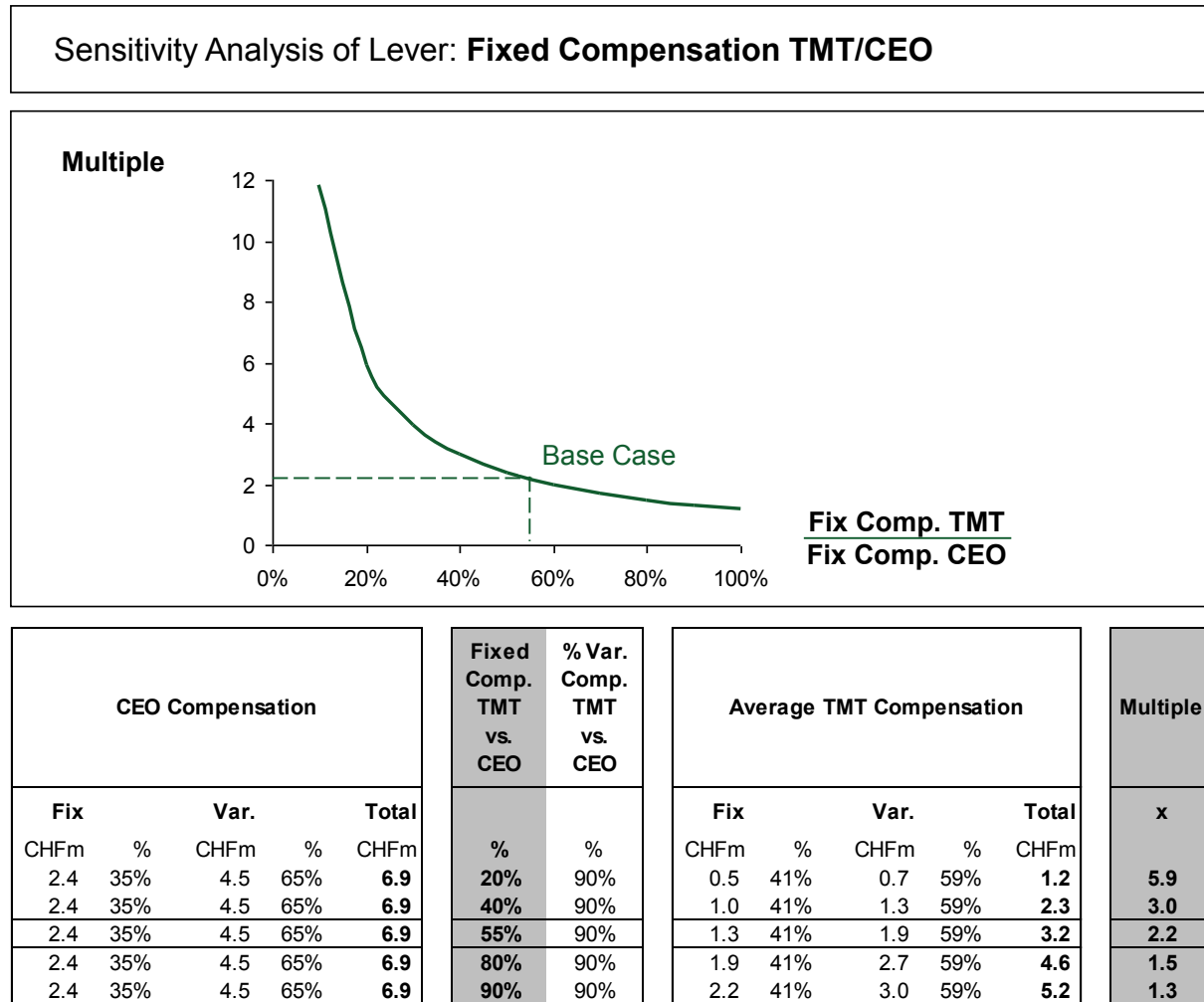
Figure 27: Sensitivity Analysis for Fixed Compensation TMT/CEO

The sensitivity analysis approximates that the average fixed TMT compensation should generally be above 50% of fixed CEO compensation to prevent strong increases in the CEO compensation multiple. This is also reflected in the graphical representation of the sensitivities in Figure 27. Moreover, the proposed limit maintains a CEO compensation multiple value of about 2.3 (i.e. median value of the SMI/SMIM company sample in this dissertation) which is almost similar to the base case with a CEO compensation multiple of 2.2. To determine suitable values of the fixed compensation component in absolute terms, Ethos (2013) proposes that base salary should not be set *"at a level exceeding the median of the company's peer group to avoid an upward ratchet of remuneration levels"* (69).

Ratio of average variable compensation proportion of TMT relative to variable compensation proportion of CEO: Finally, another important parameter for managing compensation gaps is the difference of variable compensation proportions of the CEO and the other TMT members.

In practice, variable compensation proportions for the CEO are frequently larger than the average variable compensation proportions for the other TMT members, as indicated by the comparison of CEO and TMT variable compensation percentages for the sample companies (cf. Ethos, 2008, 2009, 2010 and 2011). This unequal distribution is also recommended by Ethos (cf. Table 40). However, a substantial number of companies still display approximately equal percentage figures of variable compensation with respect to total compensation for both the CEO and the average TMT member. On average, the variable compensation proportions of CEO and TMT members in SMI and SMIM firms differ about 5% in absolute terms (PWC, 2012a: 13).

What are the implications of equal or unequal variable compensation proportions for the CEO and the other TMT members? In case of a notably higher proportion of variable compensation for the CEO than for the average TMT member, the CEO profits disproportionately from good firm performance, thus leading to a higher CEO compensation gap and CEO pay multiple in case of good firm performance. Small differentials, in contrast, ensure a more moderate increase in the CEO compensation gap or CEO compensation multiple along with better firm performance. The calculation examples of the sensitivity analysis in Figure 28 illustrate this point, which is complete with a graphical illustration of sensitivities. The base case is marked by a frame in the calculation examples and with a dashed line in the graphical illustration. The variable which is altered in the calculations (i.e. share of variable compensation of TMT over CEO) and the resulting CEO compensation multiple are highlighted in grey.
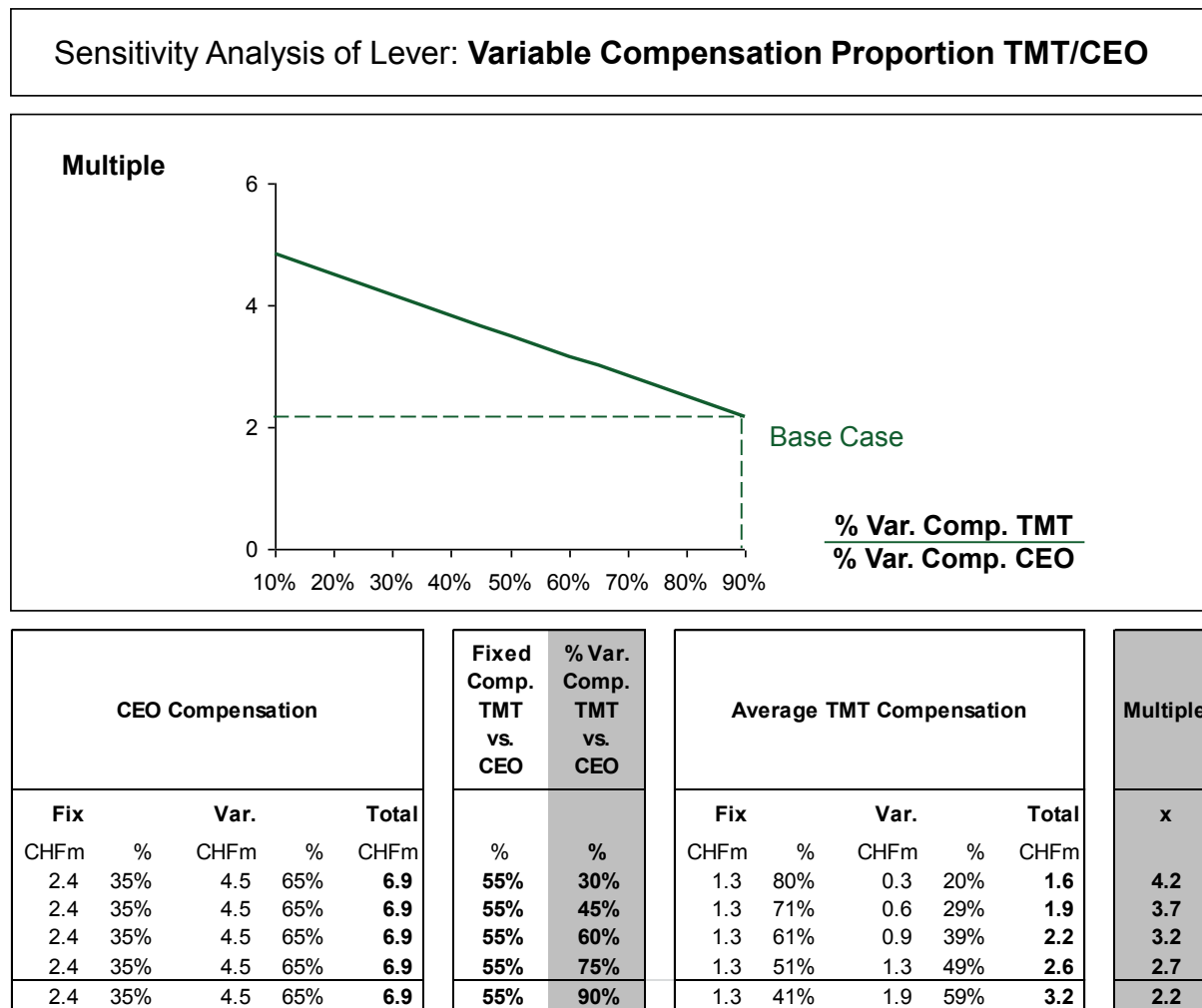
Figure 28: Sensitivity Analysis for % of Variable TMT/CEO Compensation

The author of this thesis also favors a slightly unequal distribution of about 5%–10% of total variable proportions of CEO and TMT,[207] in line with the Ethos recommendations above. The reason for this recommendation is that in the end, the CEO is assumed to have still more direct influence on firm performance than other top executives. Consequently, CEO compensation should be relatively more exposed to firm performance variations than TMT compensation, which is ensured by means of a higher variable proportion. Furthermore, while variable CEO compensation should only depend on firm performance, the link with firm performance of the other TMT compensations can additionally be reduced through setting complementary individual performance objectives that do not directly relate to firm performance (Ethos, 2013:

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[207] This corresponds to a share of variable compensation TMT/CEO of about 85–93% for the base case.

69), but might, for example, be linked to risk management, human resources, or innovation.

b) CDM Principles (Reversed KISS)

The main insights into the implementation of CEO-TMT compensation disparity management that have been discussed earlier can well be summarized according to the reversed KISS principles developed by Hilb (cf. for example 2005: 7 ff.). These demand to keep corporate governance situational, strategic, integrated, and controlled (cf. Figure 29) and may also be applied to CDM at the executive board level, especially since executive compensation also constitutes a corporate governance mechanism. The reversed KISS principles for CDM are discussed in the following, condensing previous explications as well as insights into the limitations of the CDM model into general principles to guide CDM in practice.

S ituational

S trategic

I ntegrated

K eep it controlled
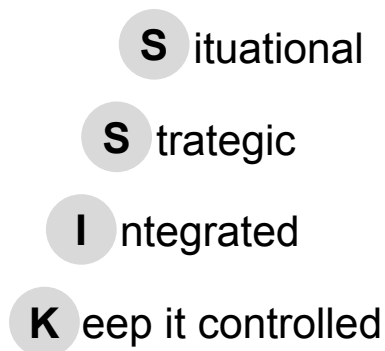
Figure 29: Reversed Kiss Principles[208]

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[208] Source: Hilb (2005: 7).

i) Keep it situational

> *"Setting pay is an art, not a science."*
>
> *(Elson & Ferrere, 2013: 5)*

The above quotation hints at a very important restraint of the compensation disparity management model introduced above: Pay setting cannot follow strict rules, but needs to *take into account the specifics of the company* at hand and should consequently rely on the judgment of the compensation committee members of the board of directors. As Elson and Ferrere (2013) note, *"shareholders elect directors for their good and objective judgment, not the mechanical and rote application of some formula"* (5).

Additionally, the process of organizing the sample firms into clusters based on two criteria contains a notable degree of simplification. As a result, the recommended compensation disparity approaches should not be applied rigidly to a company without considering its specific situation. The following notes will illustrate this point. The ownership structure of listed firms may for instance have important implications for their compensation approach, as in the case of family-controlled and managed firms (Glass Lewis & Co., 2013: 17). Furthermore, the compensation approach assigned to Cluster 2 (Accentuated Best Performer Disparity) may be more suitable to universal banks with different business areas than to larger private banks solely active in private banking. The latter may consider implementing, for example, an Accentuated CEO Compensation Disparity approach. Furthermore, other non-banking companies with a strong standing of different business area heads in the top management team may prefer a best performer approach as well, such as the approaches developed for company Clusters 2 (Accentuated Best Performer Disparity) and 4 (Balanced Best Performer Disparity). In this sense, the context of the individual firm and executives' characteristics should be kept in mind when applying the CDM framework which constitutes merely a general guideline to be adapted to the specific situation.

ii)   Keep it strategic

The choice of CDM approach should be aligned with company strategy, i.e. the top management compensation disparity strategy should be aligned with overall company goals. It should be considered what objectives need to be achieved through the specific CEO and TMT compensation design, and a compensation disparity strategy should be selected accordingly. Subsequently, the concrete configuration of compensation disparity parameters should be a consistent reflection thereof. With regard to company strategy and firm objectives, it is recommended to take a stakeholder value perspective. Therefore, firm objectives should not only include financial objectives, but also non-financial objectives, such as maintaining a positive public image which nowadays is strongly influenced by compensation decisions.[209]

iii)   Keep it integrated

Hilb (2007: 21) notes that in current compensation practice, functional job evaluation systems are frequently only applied up to the TMT level, which lays bare the risk of excessive CEO compensation sums if the CEO function is not included in the firm-wide compensation evaluation system. Therefore, keeping it integrated with respect to executive compensation disparity management postulates the use of a consistent and integrated firm-wide compensation system spanning the whole organization, including the CEO (cf. also Elson & Ferrere, 2013: 5). Elson and Ferrere (2013) further point out that *"since the CEO is an employee of the corporation, his or her pay should be considered an extension of the infrastructure that governs the rest of the company's wage structure. Internal consistency or pay equity throughout the organization, up to and including the CEO, is a natural and reasonable objective"* (5). They add that executive compensation should be grounded on *"the same foundations and precepts"* (5) as the compensation of other employees.

This relates to the notion of relativity once again: In order to prevent CEO compensation excesses, the CEO should be included in an integrated firm-wide compensation system which should rely on relative dimensions, which means CEO

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[209] Cf. Chapter 1.2.2.

compensation is set in relation to the compensation of those executives who report to the CEO. This may be achieved through the definition of ranges for CEO compensation multiple, as discussed above. The idea of relative dimensions as determinants of CEO compensation is also formulated by Hilb (2007: 21) who notes that CEO compensations sums not only have to be in line with the market-equivalent compensation sums, but also to be oriented to the compensation sums awarded to the direct reports of the CEO. Furthermore, keeping it integrated also implies that CEO compensation multiples should not be lowered by raising the compensation sums of the direct reports of the CEO, but rather by a reduction in the sometimes vast compensation sums of CEOs. Such a reduction in CEO compensation sums would probably result from integrating the CEO into the firm-wide compensation system which would simultaneously ensure that top management compensation would not increase disproportionately compared to the compensation of other employees, as stipulated by Ethos (2013: 68). Moreover, lowering vast CEO compensation sums would account for the cultural differences between Switzerland and the US, since Switzerland's lower individualism score corroborates less extreme CEO compensation sums (cf. Chapters 2.1.3 and 4.2.2).

iv)   Keep it controlled

Keeping compensation disparity at the top management level controlled requires that compensation disparity is measured. The most practical measure for this purpose seems to be CEO compensation multiple as it is independent of firm size and reflects a relative dimension that also allows comparisons with other firms. In order to keep CEO-TMT compensation disparity controlled, acceptable ranges of CEO compensation multiple have to be defined in advance which are a harmonious extension of the overall firm-wide compensation system. Defining such ranges still allows for a positive association between CEO compensation gaps and firm performance, as proposed by tournament theory, but with an upper limit.

In the process of defining such CEO compensation multiples, *scenarios* should be calculated in advance for different possible outcomes to get a feeling of the largest and smallest possible CEO compensation multiples. Based on these scenarios, compensation parameters, such as base salary, potential ranges of variable proportions

for the CEO, as well as different ratios of variable TMT compensation proportion to variable CEO compensation proportion, may be adapted. An efficient starting point for managing CEO compensation multiples is to set an upper limit to the variable proportion of CEO total compensation, as very large variable compensation proportions frequently go along with vast CEO compensation gaps and multiples.

5 Concluding Part

This chapter is structured in four subchapters: Chapter 5.1 summarizes the main content and insights of this dissertation, Chapter 5.2 highlights general recommendations for practice, Chapter 5.3 draws implications for theory and Chapter 5.4 outlines limitations and recommendations for further research.

5.1 Summary

This dissertation provides insights into the link between CEO compensation gap and firm performance, with CEO compensation gap referring to the difference between CEO compensation and the average compensation of their direct reports. Based on an overview of the current state of knowledge in the literature review, hypotheses were developed which state the assumed direction of the relationship between CEO compensation gap and firm performance, as well as the expected influence of potential moderating variables of this relationship. These hypotheses were then empirically tested with a sample of Swiss publicly traded companies.

As highlighted in Chapter 1.2.1, there is a topical research gap as executive compensation studies have scarcely addressed compensation differences within the executive board. Yet, the research gap is additionally – and also most importantly – a geographical one, as extant executive compensation research has been performed almost entirely in the US context. This emphasizes the need for studies in different country settings.

Therefore, the specifics of Switzerland in terms of compensation (Chapter 2.1.1), corporate governance (Chapter 2.1.2) and culture (Chapter 2.1.3) were described, contrasting it with the US. It was shown that the average CEO compensation level in Switzerland figures among the highest worldwide, even though it does not reach the compensation sums paid in the US. Furthermore, it was noted that the variable proportion of total compensation sums in general tends to be higher for CEOs than for the other TMT members. Further differences between Switzerland and the US were highlighted in terms of corporate governance systems, where Switzerland seems to have stronger management control mechanisms and less CEO duality, and finally, in terms of culture. Despite strong performance orientation in both countries, Switzerland can be characterized as a low-key culture, whereas visible rewards and

subsequent inequality as a result of individual achievements are accepted practice in the US. Finally, it was remarked that in light of increasing internationalization of Swiss firms, it is questionable to what extent compensation systems in large Swiss firms are still a reflection of Swiss cultural values.

Chapter 2.2 presented the major theories with regard to the relationship of compensation distribution, especially within the executive board, and firm performance. *Tournament theory* stipulates a positive association of CEO compensation gap with firm performance. It argues on the basis of incentive effects of compensation differentials and assumes that these motivate TMT members to exert additional effort to become CEO themselves, which pushes firm performance. *Equity theory*, in contrast, proposes a negative relationship between CEO compensation gap and firm performance, because more equally distributed compensation is considered to be conducive to more harmonious social relations which, in turn, facilitate collaboration, thereby positively impacting firm performance. *Team player theory* is introduced as an intermediate theory between tournament theory and equity theory, combining the positive aspects of both theories. This theory does not assume a link of CEO compensation gap and firm performance, but rather a relationship between team performance and compensation. While it allows for clear pay differences within the executive board, it views these differences in pay as related to differences in marginal products.

Subsequently, Chapter 2.3 covered exemplary compensation concepts, discussing fairness arguments and their implications for variable compensation setting, and illustrating executive compensation setting in practice based on four brief best practice company examples in Switzerland. With regard to CEO compensation gap, these best practice company examples show a tendency toward smaller pay disparity within the executive board, which is more in line with equity theory than with tournament theory. However, one case of a tournament theory-like CEO-TMT compensation disparity could also be observed. Furthermore, the best practice examples highlighted the positive association of well-designed compensation systems with firm performance and provided valuable insights into compensation setting in practice.

As the literature review in Chapter 2.4.1 showed, previous studies found comparable support for both tournament theory and equity theory. Team player theory was only tested in the study by Ang et al. (1998: 355), who concluded that it seemed to be supported by the analyses. The literature review on moderating variables of the relationship between CEO-TMT compensation differences and firm performance followed in Chapter 2.4.2. Various studies have examined different potential moderators which may be categorized as constituting CEO characteristics, corporate governance characteristics, or firm and industry characteristics. This dissertation focused on the moderating variables relating to CEO characteristics, thus contributing to test the applicability of previous results to other country contexts and expanding their generalizability.

Six main hypotheses (one of them incl. 3 sub-hypotheses) were tested in the empirical part of Chapter 3. *Hypotheses 1 and 2* are based on agency theory (cf. Chapters 2.2 and 2.3.1) and propose a positive association between CEO compensation, or average TMT compensation, and firm performance. *Hypotheses 3 to 6* are formulated on tournament theory. *Hypothesis 3* is a general hypothesis on the relationship between CEO compensation gap and firm performance which is assumed to be positive. The following three hypotheses deal with potential moderating variables related to CEO characteristics and state the following associations: Having a CEO who is close to retirement was expected to have a positive moderating effect (*Hypothesis 4*), while the CEO recruitment factors (*Hypothesis 5a*: having a new CEO in office; *Hypothesis 5b*: having a CEO hired from outside the firm in office; and *Hypothesis 5c*: having a new CEO in office who has been hired from outside the firm) were assumed to have a negative moderating effect (*Hypothesis 5*). *Hypothesis 6* states a negative moderating effect of CEO duality.

These hypotheses were tested based on a panel of 168 observations over a four-year period from 2007 to 2010. All companies included in the sample were either part of the SMI or SMIM indices. The main quantitative analysis relied on multiple (moderated) OLS regressions. Subsequently, robustness tests, including firm fixed effects regressions, were conducted. Firm performance as the dependent variable was measured with ROE, ROA, and MTB, thereby representing both stock market-based and accounting-based measures. CEO compensation gap was tested mainly in the form of total compensation gap, but was also differentiated into long-term and short-

term compensation gaps. Besides, control variables were included and moderating variables were added separately to the regression model (cf. Chapter 3).

By interpreting the empirical results in consideration of the theoretical foundation, a compensation disparity management (CDM) framework was developed in Chapter 4 with concrete cluster-specific guidelines and general principles. Within this framework, CEO compensation multiple was used as the main compensation disparity measure (cf. definition below).

With regard to the research questions posed in Chapter 1.3, the following findings were elaborated:

> 1. How can compensation differences within the executive board be measured?

Three types of generic measures for compensation differences within the executive board were identified which also appeared in the literature review (Chapter 2.4.1): [210]

- *CEO compensation gap:* measured as CEO compensation minus average TMT member compensation.

- *CEO's pay slice:* measured as the proportion of CEO compensation in relation to the aggregate top five compensation sum.

- *CEO-TMT compensation dispersion:* measured as the coefficient of variation of compensation across the executive board (calculated as the standard deviation of the compensation of the executive board members divided by the mean compensation of the executive board members).

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[210] Sometimes, the definitions of these measures showed slight variations in the different studies of the literature review, e.g. calculation of CEO compensation gap based on detailed compensation figures of the five highest paid top managers within a firm for US studies, instead of average TMT compensation figures for the entire TMT as used in this Swiss-based dissertation.

Furthermore, the author of this study defined another relative CEO-TMT compensation disparity measure:

- *CEO compensation multiple:* measured as total CEO compensation divided by average total TMT member compensation.

As a relative measure, CEO compensation multiple is related to the measure of CEO's pay slice by Bebchuk et al. (2007), but is better adapted to Swiss data availability. As CEO's pay slice (as well as CEO-TMT compensation dispersion) relies on the publication of the compensation sums of the five highest earning executive board members, it is applicable to the US, but cannot be calculated in this study in view of the current state of Swiss compensation transparency.

Thus, due to data availability and comparability, CEO compensation gap was chosen for the regression analyses in Chapter 3, while CEO compensation multiple was the main measure used within the compensation disparity management (CDM) framework in Chapter 4.

> 2. Is there a link between CEO compensation gap and firm performance? How are the underlying compensation measures (CEO compensation and TMT compensation) linked with firm performance?

CEO compensation gap and firm performance seem to have a significant and positive association that is independent of the operationalization of firm performance (ROE, ROA and MTB), CEO compensation gap measures (as TOTALGAP; LTGAP and STGAP), and applied industry controls. Furthermore, this positive association also remains robust when adding firm fixed effects.

With respect to the underlying compensation measures CEO compensation and TMT compensation, evidence was found for significant and positive associations with firm performance. These results are independent of firm performance operationalization as well (cf. Chapter 3 for further details).

3. Which moderating variables influence the strength of the relationship between CEO compensation gap and firm performance?

As proposed by theory, there are factors that influence the strength of the association between CEO compensation gap and firm performance. Of the potential moderating variables that were tested, "CEO duality" seems to be the most significant moderator, displaying a negative moderating effect as proposed by *Hypothesis 6*. Furthermore, this is also the only moderator that yields significant results in support of the hypotheses built on tournament theory.

The moderators "Retiring CEO" (*Hypothesis 4*) and "Outside CEO" (*Hypothesis 5b*) yield relatively robust and significant results which, however, contradict the direction of influence proposed in the corresponding hypotheses. The variable "Outside CEO" has a positive moderating effect, whereas "Retiring CEO" has a negative moderating effect. For the variable "New CEO" (*Hypothesis 5a*), results were not significant and for the variable "New outside CEO" (*Hypothesis 5c*) results were inconsistent. To sum up, three of the five potential moderating variables yielded significant and consistent results and, therefore, constitute relevant moderating variables of the relationship between CEO compensation gap and firm performance (refer to Chapter 3.5 for further details).

4. Which CEO-TMT compensation distribution theory is supported by the results?

While the significant and generally positive relationship between CEO compensation (or TMT compensation) and firm performance supports agency theory, the results of the analyses of CEO compensation gap and its moderators shed light on the validity of CEO-TMT compensation distribution theories. The significant and positive relationship between CEO compensation gap and firm performance (*Hypothesis 3*), as well as the significant and negative moderating effect of CEO duality (*Hypothesis 6*), supports tournament theory. However, the direction of moderating effects for the other moderating variables tested runs contrary to tournament theory predictions. Overall, empirical results do not fully support tournament theory, even though clear tournament theory characteristics could be detected.

Based on these quantitative results, findings of qualitative literature research and some additional analyses, the author derived mixed-theory, cluster-specific compensation disparity approaches in Chapter 4, incorporating aspects of tournament theory, team player theory, and equity theory. These may be applied for compensation disparity management in practice.

The following two chapters (Chapters 5.2 and 5.3) address the summary of the fifth research question:

> 5. Which recommendations for practice and research can be derived with regard to compensation disparity at the executive board level?

5.2 Implications for Practice

The compensation disparity management (CDM) framework in Chapter 4 is made up of the elements a) *contextual factors* which build the basis for compensation disparity decisions, b) *compensation disparity analysis and classification* which derives company clusters with the clustering dimensions firm size and industry association and aligned compensation approaches, and c) *compensation disparity management*, including the discussion of compensation configuration parameters and general CDM design principles according to the reversed KISS principles by Hilb (2005: 7). The CDM framework provides very practice-oriented recommendations for CEO and TMT compensation setting comprising an upper ceiling of 3 to CEO compensation multiple, a maximum proportion of 75% of variable CEO compensation, a minimum proportion of 50% fixed TMT compensation in relation to fixed CEO compensation, and a maximum absolute percentage difference of 5–10% for the variable TMT compensation share relative to the variable CEO compensation share. The CEO should be integrated into the firm-wide compensation system which is expected to lead to a reduction in the vast CEO compensation gap due to lower total CEO compensation sums (cf. Chapter 4.2.4). The dissertation further proposes managing and controlling compensation disparity at the executive board level by defining ranges for CEO compensation multiple and calculating scenarios to gauge the potential effects of compensation decisions. However, these recommendations are meant to be

guidelines – compensation disparity management should always remain situational and strategic.

Finally, this subchapter concludes with some critical remarks regarding compensation disparity at the executive board level. In light of the current discussion about vast executive compensation sums, these general implications for practice might be of interest for the board of directors and shareholders of large and medium-sized Swiss companies, regulating institutions and Swiss society in general.

Consider drawbacks of large CEO compensation gaps

In general, better firm performance does justify higher rewards for the executive board. However, Swiss companies should still critically evaluate existing CEO compensation gaps and should ask how far the executive compensation packages awarded are maintainable, especially when comparing them with the compensation figures of other Swiss firms considering their size, industry, and performance levels. As suggested by the political initiatives mentioned before and the repeated emphasis on relativity within this study, large compensation differences have downsides, too. In this respect, Henderson and Fredrickson (2001: 113) voice the possibility that the positive effects of large pay gaps might be outweighed in the future by the negative emotions they generate among those employees who do not have any chances to reach the executive board level. Therefore, they opine that *"CEOs and boards should consider the mixed signals that their executive pay packages are sending, signals that affect both their own credibility and the type of person – driven, but political, individualistic, and possibly cynical – who will self-select into their executive ranks"* (113). As a whole, these considerations pertain to important sustainability issues in that the justification of the use of sizeable executive pay sums in general, and large CEO compensation gaps in particular, as a means of providing individual performance incentives seems questionable, neglecting potential disturbing effects on motivation of the remaining workforce. Assuming that large CEO compensation gaps actually add to work motivation within the TMT, it is still doubtful if the positive effects are not offset by reduced motivation of other employees in the long term.

Besides, increasing CEO compensation gaps in order to induce higher firm performance only makes sense up to a certain point. Beyond that point (which has been pinned down in this thesis to a CEO compensation multiple of about 3), further increases in CEO compensation gap and CEO compensation multiple do not tally with better firm performance, but only with higher compensation-related costs. Thus, it should be kept in mind that the expression "the bigger, the better" is not an infinite principle.

Set suitable compensation-related limits

As this empirical study shows, larger CEO compensation gaps are generally associated with better firm performance and consequently, seem to have some advantages as incentive structures. As Wagner (PWC, 2012b) notes with regard to compensation limits *"there are also advantages of a steep compensation curve within a company: those who work hard and are successful shall be rewarded."*[211] However, this does not mean that setting limits to executive compensation is counter-productive even though the Swiss "1:12-for fair wages"-initiative quite certainly overshot the mark with its goal to limit the relation of compensation of the lowest paid employee to the highest paid one within the same company to a maximum of 1:12, as it neglected the necessary situational differentiation. A good approach to *limit the sum of executive board compensation is to set it in relation to total profits generated* by the company and limit it as a percentage thereof.[212] This makes it possible to take into account industry characteristics as well as firm size for the determination of compensation sums. In line with this, bonus should only be paid out insofar as it is covered by firm profits. Furthermore, setting limits might be especially efficient with regard to the *maximum proportion of variable compensation in relation to total compensation* for the CEO and members of the executive board, as well as defining *ranges for the maximum CEO compensation multiple*, depending on target achievement. Such limits

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[211] Translation of the original German sentence: "[…] es hat auch Vorteile, wenn die Einkommenskurve innerhalb eines Unternehmens steil ist: wer sich anstrengt und erfolgreich ist, soll auch belohnt werden."

[212] A comparable approach has been implemented, for example, by Credit Suisse and UBS. In its Annual Report 2012, Credit Suisse mentioned that *"the sum of all the incentive compensation awards for the Executive Board remains subject to an overall cap of 2.5% of Group underlying net income, irrespective of individual performance"* (193).

should contribute to counteract significant executive overpayment, while still allowing for the desired incentive effects of compensation setting.

Having discussed the practical implications of this dissertation, the following subchapter focuses on implications for theory.

5.3 Implications for Theory

Considering the predominance of US-focused research on CEO-TMT compensation distribution in particular and executive compensation in general, this dissertation provides an important test of generalizability of the mainly US-based results. By analyzing CEO compensation gaps in Swiss publicly traded firms, the dissertation contributes to expanding the understanding of CEO-TMT compensation differences and their link with performance for firms of a different national context.

While the theoretical part of the dissertation already provided some indications for differences in culture which might as well impact the relationship of compensation practices and firm performance, the regression analyses further showed that empirical findings of US studies cannot be transferred one-to-one to other national and cultural contexts (cf. Chapter 3.5).

Regression analyses in this dissertation showed a significant and positive association of CEO compensation as well as average TMT compensation with firm performance for the Swiss-based sample. This reflects in general a good alignment of pay-for-performance and supports a functioning agency theory setup in Swiss SMI and SMIM firms.

While the significant and positive association of CEO compensation gap and firm performance is in line with tournament theory predictions, the tournament theory hypotheses regarding the influence of moderating variables could not be confirmed for most variables. While one moderator (CEO duality) yielded results in line with the tournament theory predictions, two other moderators (Retiring CEO and Outside CEO) showed a contradictory direction of influence and two moderating variables yielded insignificant results (New CEO and New outside CEO). Hence, it seems that tournament theory and equity theory may not suffice as theoretical approaches to explain performance effects of executive pay distributions. Instead, compensation setting reality may be too complex to be mapped by these rather straightforward

theories. Therefore, these theories may need to be enriched with elements of other approaches, such as team player theory, to get a closer grasp of reality.

Furthermore, the results of this dissertation underscore the importance of using subsamples selected according to certain criteria, if possible. The analyses of the association of CEO compensation multiple and firm performance based on two subsamples divided according to the size of CEO compensation multiple showed that the detected relationship only holds if observations with a small CEO compensation multiple are included. When only examining a sample of observations with CEO compensation multiples above the mean, the positive association of CEO compensation multiple and firm performance cannot be shown anymore. This implies that the positive association of CEO compensation multiple and firm performance which tournament theory predicts does not necessarily apply to the whole sample, but there may be CEO compensation multiples which are out of bounds, i.e. they are so high that the link with firm performance may be lost (cf. Chapter 4.2.4).

5.4 Limitations and Further Research Directions

While the limitations of the quantitative analyses were already discussed in detail in Chapter 3.6, this chapter aims to highlight the major constraints of the dissertation more comprehensively. These general constraints pertain to the use of panel data, the presentation of quantitative results, and assumptions and personal judgments made within this thesis.

Use of Panel Data

As already mentioned in Chapter 3.6.2, the analyses of this dissertation are based on data of SMI and SMIM companies over a four-year period (i.e. panel data). Thus, despite the number of 168 observations, results do not reflect a large proportion of Swiss stock market-quoted companies, but only the approximately 50 biggest companies, hence the inapplicability of the results to smaller companies of the Swiss stock market. Moreover, as indicated above, the panel data used in this thesis compiles multiple observations for the majority of firms. As Verbeek (2004) argues, however, this increases the efficiency of estimators in quantitative analyses compared to conducting several cross-sectional analyses (cf. Chapter 1.4). Furthermore, owing to the higher number of observations, testing moderating effects becomes possible.

Having access to several observations for the same company at different points in time also enables performing fixed effects regressions and allows controlling for unobserved variables. Overall, there are many advantages which speak in favor of using panel data; nevertheless, it has to be kept in mind that the sample does not represent 168 individual companies, but includes only data of 54 different companies (cf. Chapter 3.1.1).

Presentation of Regression Models

From a statistical perspective, regression models should only contain significant variables (Backhaus et al., 2000: 19). However, this dissertation also intends to show that in some instances, certain coefficients in the regression models are not significant. Moreover, a dissertation should also integrate into existing scientific literature of the relevant area of research. In the existing scientific literature on the topic of CEO-TMT compensation differences and firm performance, it is common practice to report the full regression models, including insignificant variables. To find a compromise between statistical theory requirements, completeness of results and integration into existing scientific literature, this dissertation reported the full regression models in the main part of the thesis, while still testing "significant variables only" regression models and reporting differing results for the variables of interest in footnotes, as well as in the Appendix for a selection of the regressions performed. This was meant to ensure a high level of statistical accuracy. However, it is also to be noted that results only deviate rarely due to these two different approaches to regression analyses and do not materially change the final results of the dissertation.

Assumptions and Personal Judgment

The CDM Framework in Chapter 4 is aimed at giving an overview of topics approached in the dissertation and at classifying these into a framework. At the same time, the framework seeks to render the insights more practice-oriented. To achieve this, assumptions and deductions had to be made regarding the theories supported by the actual data, as well as assumptions for deducing clustering dimensions and describing the represented companies within one cluster. Consequently, not all aspects of the CDM Framework are entirely quantitatively backed.

As mentioned earlier, the implementation paths derived in Chapter 4.2.4 incorporate a significant amount of personal judgment and are meant to be considered as exemplified compensation designs instead of strict recommendations. These implementation paths aim to serve as an exemplary way of implementing the underlying considerations, but should remain subject to company-specific and situational adaptations.

In line with this and as mentioned before, the delimitation of the CEO compensation multiple at a maximum of 3 is a rough approximation, not a concrete calculation. It is derived from the observation that the positive link between CEO-TMT compensation disparity and firm performance gets lost when compounding a sample with CEO compensation multiples above the overall sample mean of 2.64, while it still holds for the sample with CEO compensation multiples below the overall sample mean. Consequently, it is very well possible that the cut-off point when the association is lost might also be at a different value of CEO compensation multiple. Still, it is clear that the association between CEO compensation multiple and firm performance is missing for the highest CEO compensation multiple values observed in the sample.

In the course of this dissertation, several topics for further research have emerged which are mentioned below.

Modification of Empirical Study: Different Moderators

While the analysis of moderating variables in this study has contributed to a more detailed understanding of the relationship between CEO compensation gap and firm performance in Switzerland, it tested only a small portion of potential moderating variables. There are still other types of moderators that might be worth studying more closely, such as factors relating to the composition and independence of the board of directors or ownership concentration. Such corporate governance variables appear to be an interesting avenue for exploration based on a Swiss company sample because the implementation of a stronger management control mechanism might have positive moderating effects on the relationship between CEO-TMT compensation differences and firm performance.[213] Such analyses would strengthen the understanding of the

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[213] Compare, for example, Lee et al. (2005).

observed relationship in Switzerland and contribute to further expanding the generalizability of results on an international level.

Extension of Empirical Study: Country Focus and Sample Size

As noted above, research on compensation disparity within the executive board is still largely based on US samples. To broaden the focus, studies in other European countries should be performed since results of this dissertation suggest that the US results are not universally applicable. Additionally, comparable studies for Swiss companies could be replicated in the future based on samples covering an extended multi-year time period when additional data becomes available. This would enable better accommodating of the sample size requirements for moderated regressions so that potential weaker moderating effects might also be detected. Furthermore, it would be interesting to see whether – and if so, how – the current legislative efforts in Switzerland will impact the relationship under consideration.

Deepening of Empirical Study: Qualitative Research

While this dissertation described executive compensation disparity patterns within SMI and SMIM firms primarily by means of quantitative data, the complexity of the uncovered interdependencies of compensation parameters and explanatory theories would call for additional qualitative studies. In-depth case studies may contribute to a better understanding of the cause-effect relationships, implying the reasons for selecting a specific compensation disparity approach and the outcome of this choice.

These ideas may provide some points of departure for further research and simultaneously demonstrate the need thereof. The relatively inconclusive research results achieved up to date and the mostly one-sided US focus of extant research in the field illustrate that the discussion of CEO-TMT compensation distributions and their association with firm performance is still at an early stage. Owing to the broad relevance of CEO and TMT compensation issues that are highlighted by the ongoing public debate on executive compensation excesses in Switzerland and even political initiatives to counteract these, the topic will continue to attract the attention of social researchers and practitioners in the years to come.

As mentioned before, *"pay setting is an art, not a science"* (Elson & Ferrere, 2013: 5; cf. Chapter 4.2.4). This work of research has tackled the issue of CEO-TMT compensation distribution from a scientific viewpoint and has generated a systematic approach to guide CEO-TMT compensation disparity decisions in practice. Yet, the quote at the beginning of this thesis has already highlighted that relativity has a crucial effect on personal judgment, and especially in the realm of executive compensation design, diverging relative perceptions of many different stakeholder groups are touched. Consequently, finding a compromise to design a sound compensation system at the executive board level will continue to remain an art, but in the process of pay setting, these research results may potentially help to guide the artist's hand.

Appendices

Appendix A   **Inferential Statistics (Chapter 3.3)**

The table reports univariate OLS regressions of MTB on CEOCOMP and TMTCOMP. Values of the t-statistics are based on heteroscedasticity robust standard errors and are reported in parentheses. The significance levels are denoted as follows: $*p < 0.10$, $** p < 0.05$, $***p < 0.01$.

Independent Variables	Dependent Variable: MTB	
	CEOCOMP	TMTCOMP
Intercept	-0.1652	0.7478 ***
	(-0.15)	(3.38)
CEOCOMP	0.0691	
	(0.99)	
TMTCOMP		174.4973
		(0.64)
R^2	0.0056	0.0027
F-statistic	0.99	0.41
Observations (N)	166	166

App. 1: Univariate Regressions of MTB on CEOCOMP and TMTCOMP

The table reports univariate OLS regressions of MTB on TOTALGAP, LTGAP and STGAP. Values of the t-statistics are based on heteroscedasticity robust standard errors and are reported in parentheses. The significance levels are denoted as follows: $*p < 0.10$, $** p < 0.05$, $***p < 0.01$.

Independent Variables	Dependent Variable: MTB		
	TOTALGAP	LTGAP	STGAP
Intercept	-0.3757	-0.0504	-0.0812
	(-0.50)	(-0.09)	(-0.08)
TOTALGAP	0.0867 *		
	(1.72)		
LTGAP		0.0668	
		(1.64)	
STGAP			0.0650
			(0.92)
R^2	0.0165	0.0176	0.0067
F-statistic	2.95 *	2.68	0.85
Observations (N)	166	131	139

App. 2: Univariate Regressions of MTB on TOTALGAP, LTGAP, STGAP

The table shows the results of multiple OLS regressions of ROE on TOTALGAP, LTGAP and STGAP which only contain significant variables. The regressions contain heteroscedasticity robust standard errors. ° specifies that only year 2007 is controlled. The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: ROE		
	TOTALGAP	LTGAP	STGAP
Intercept	-0.4014 *	-0.0185	-0.2488
	(-1.89)	(-0.11)	(-0.97)
TOTALGAP	0.0593 ***		
	(3.46)		
LTGAP		0.0362 ***	
		(3.08)	
STGAP			0.0439 **
			(2.22)
SIZE			0.0233 *
			(1.80)
DUAL			-0.2000 ***
			(-3.29)
LEV	-0.1333 **	-0.1193 **	-0.0062 **
	(-2.00)	(-2.03)	(-2.56)
CEOAGE	-0.0042 *	-0.0049 **	
	(-1.91)	(-2.15)	
TMTCOUNT			
R^2	0.1145	0.1252	0.1744
F-statistic	5.41 ***	6.97 ***	7.21 ***
Observations (N)	168	131	141
Year dummies	no	yes°	yes°
Industry dummies	no	no	no

App. 3: Multiple Regressions of ROE on TOTALGAP, LTGAP, STGAP

Analysis performed with significant variables only.

The table shows the results of multiple OLS regressions of ROA on TOTALGAP, LTGAP and STGAP which only contain significant variables. The regressions contain heteroscedasticity robust standard errors. ° specifies that only year 2007 is controlled. The significance levels are denoted as follows: $*p < 0.10$, $** p < 0.05$, $***p < 0.01$.

Independent Variables	Dependent Variable: ROA		
	TOTALGAP	LTGAP	STGAP
Intercept	-0.0621	0.0523	0.0018
	(-0.58)	(0.58)	(0.01)
TOTALGAP	0.0128 **		
	(2.17)		
LTGAP		0.0081 *	
		(1.92)	
STGAP			0.0142 *
			(1.67)
SIZE	0.0150 *	0.0130 *	0.0123 *
	(1.94)	(1.69)	(1.88)
DUAL			
LEV	-0.1756 ***	-0.1900 ***	-0.2076 ***
	(-6.51)	(-7.84)	(-8.68)
CEOAGE	-0.0017 **	-0.0020 ***	-.0024 ***
	(-2.43)	(-2.98)	(-3.10)
TMTCOUNT			
R^2	0.2516	0.2705	0.2994
F-statistic	24.61 ***	16.98 ***	20.96 ***
Observations (N)	168	131	141
Year dummies	no	yes°	yes°
Industry dummies	no	no	no

App. 4: Multiple Regressions of ROA on TOTALGAP, LTGAP, STGAP

Analysis performed with significant variables only.

The table shows the results of multiple OLS regressions of MTB on TOTALGAP, LTGAP and STGAP which only contain significant variables. The regressions contain heteroscedasticity robust standard errors. ° specifies that only year 2007 is controlled. The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: MTB		
	TOTALGAP	LTGAP	STGAP
Intercept	1.6949 ***	2.5183 ***	2.9490 ***
	(2.63)	(4.53)	(5.81)
TOTALGAP	0.1103 **		
	(2.11)		
LTGAP		0.0692	
		(1.58)	
STGAP			
SIZE			
DUAL			0.3070 *
			(1.93)
LEV	-1.5042 ***	-1.4678 ***	-1.5927 ***
	(-6.90)	(-5.78)	(-6.33)
CEOAGE	-0.0308 ***	-0.0345 ***	-0.0293 ***
	(-3.56)	(-3.58)	(-3.19)
VPNUMBER			0.2155 **
			(2.07)
R^2	0.2652	0.2577	0.2788
F-statistic	17.52 ***	13.59 ***	11.98 ***
Observations (N)	166	131	139
Year dummies	yes°	yes °	yes
Industry dummies	no	no	no

App. 5: Multiple Regressions of MTB on TOTALGAP, LTGAP, STGAP

Analysis performed with significant variables only.

Appendix B   **Robustness Tests (Chapter 3.4)**

The table shows the results of the multiple firm fixed effects regressions of ROE, ROA and MTB on CEOCOMP and TMTCOMP. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors which are clustered by firm. The fixed effects regressions contain year dummies (not shown). The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	ROE		ROA		MTB	
	CEOCOMP	TMTCOMP	CEOCOMP	TMTCOMP	CEOCOMP	TMTCOMP
Intercept	-1.3626	0.8403	-0.1442	0.5893	-0.4397	8.0685 ***
	(-0.85)	(0.96)	(-0.25)	(1.51)	(-0.15)	(3.82)
CEOCOMP	0.1180 **		0.0401 **		0.4710 ***	
	(2.34)		(2.62)		(5.18)	
TMTCOMP		-416.1930 **		-165.9440 ***		-1374.9250 ***
		(-2.41)		(-3.18)		(-3.96)
SIZE	-0.0485	-0.0811	-0.0374	-0.0457	-0.6214 **	-0.7625 ***
	(-0.41)	(-0.81)	(-0.76)	(-1.05)	(-2.36)	(-3.12)
DUAL	-0.1019	-0.0850	-0.0402	-0.0354 *	-0.0597	-0.0210
	(-1.43)	(-1.53)	(-1.56)	(-1.69)	(-0.38)	(-0.19)
LEV	0.3110	0.3024	-0.0640	-0.0670	1.8952 ***	1.8968 ***
	(1.26)	(1.12)	(-0.97)	(-0.94)	(4.44)	(3.43)
CEOAGE	-0.0016	0.0010	-0.0002	0.0007	-0.0163 **	-0.0015
	(-0.87)	(0.57)	(-0.34)	(0.95)	(-2.08)	(-0.22)
TMTCOUNT	0.0452	0.0993	-0.0003	0.0223	-0.1213	0.0399
	(0.63)	(1.13)	(-0.02)	(1.08)	(-0.69)	(0.21)
R^2	0.1791	0.1875	0.1919	0.2223	0.6044	0.5902
F-statistic	4.76 ***	3.92 ***	3.91 ***	4.01 ***	20.94 ***	16.89 ***
Observations (N)	161	161	161	161	159	159
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	no	no	no	no	no	no

App. 6: Fixed Effects Regressions of ROE, ROA and MTB

The table shows the fixed effects regressions of ROE on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year dummies (not shown) and firm fixed effects. The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: ROE					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	-0.0592	-0.4116	-0.1150	-0.7768	-0.0664	-0.3887
	(-0.04)	(-0.38)	(-0.08)	(-0.67)	(-0.06)	(-0.36)
TOTALGAP	0.0591 *	0.0664 **	0.0610 *	0.0478 *	0.0450 *	0.0741 **
	(1.92)	(2.43)	(1.83)	(1.77)	(1.91)	(2.71)
SIZE	-0.0879	-0.0591	-0.0887	0.0111	-0.0633	-0.0791
	(-0.77)	(-0.60)	(-0.78)	(0.11)	(-0.58)	(-0.79)
DUAL	-0.0827	-0.0839	-0.0827	-0.1169 *	-0.0807	0.7372
	(-1.15)	(-1.48)	(-1.01)	(-1.89)	(-1.30)	(1.56)
LEV	0.3088	0.3211	0.3272	0.3050	0.3022	0.2810
	(1.19)	(1.33)	(1.24)	(1.16)	(1.13)	(1.16)
CEOAGE	-0.0013	-0.0020	-0.0009	-0.0008	-0.0014	-0.0006
	(-0.72)	(-0.91)	(-0.46)	(-0.38)	(-0.78)	(-0.35)
TMTCOUNT	0.0375	0.0394	0.0380	0.0156	0.0364	0.0427
	(0.52)	(0.53)	(0.52)	(0.23)	(0.58)	(0.59)
Moderating Factors						
H4: RETCEO		1.0562 *				
		(1.70)				
TOTALGAP*RETCEO		-0.0676				
		(-1.65)				
H5a: NEWCEO			0.0160			
			(0.03)			
TOTALGAP*NEWCEO			0.0002			
			(0.00)			
H5b: OUTCEO				-1.5364 **		
				(-2.04)		
TOTALGAP*OUTCEO				0.0973 *		
				(1.94)		
H5c: NEWOUTCEO					2.3751	
					(-1.22)	
TOTALGAP*NEWOUTCEO					0.1716	
					(1.27)	
H6: TOTALGAP*DUAL						-0.0549 *
						(-1.79)
R^2	0.1614	0.1799	0.1643	0.1997	0.2290	0.1839
F-statistic	5.17 ***	9.46 ***	5.30 ***	4.61 ***	4.90 ***	5.50 ***
Observations (N)	161	161	161	161	161	161
Year dummies	yes	yes	yes	yes	yes	yes

App. 7: Moderated Fixed Effects Regressions of ROE

The table shows the fixed effects regressions of ROA on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year dummies (not shown) and firm fixed effects. The significance levels are denoted as follows: *$p < 0.10$, ** $p < 0.05$, ***$p < 0.01$.

Independent Variables	Dependent Variable: ROA					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	0.2493	0.0839	0.2268	-0.1732	0.2413	0.1441
	(0.50)	(0.19)	(0.44)	(-0.36)	(0.50)	(0.32)
TOTALGAP	0.0226 **	0.0262 **	0.0239 *	0.0220 *	0.0189 *	0.0274 **
	(2.12)	(2.58)	(2.01)	(1.98)	(1.84)	(2.61)
SIZE	-0.0490	-0.0379	-0.0505	-0.0038	-0.0419	-0.0462
	(-1.04)	(-0.87)	(-1.07)	(-0.08)	(-0.91)	(-1.05)
DUAL	-0.0343	-0.0335 *	-0.0353	-0.0627 **	-0.0341	0.2275
	(-1.29)	(-1.79)	(-1.17)	(-2.47)	(-1.44)	(1.38)
LEV	-0.0645	-0.0556	-0.0557	-0.0652	-0.0668	-0.0734
	(-0.94)	(-0.91)	(-0.80)	(-0.94)	(-0.95)	(-1.15)
CEOAGE	-0.0002	-0.0002	0.0000	0.0007	-0.0003	0.0000
	(-0.31)	(-0.22)	(-0.01)	(0.82)	(-0.37)	(-0.01)
TMTCOUNT	-0.0025	-0.0013	-0.0023	-0.0151	-0.0027	-0.0008
	(-0.13)	(-0.06)	(-0.12)	(-0.87)	(-0.15)	(-0.04)
Moderating Factors						
H4: RETCEO		0.4727 ***				
		(2.86)				
*TOTALGAP*RETCEO*		-0.0309 ***				
		(-2.76)				
H5a: NEWCEO			0.0386			
			(-0.29)			
*TOTALGAP*NEWCEO*			-0.0020			
			(-0.23)			
H5b: OUTCEO				-0.4818 **		
				(-2.35)		
*TOTALGAP*OUTCEO*				0.0279 **		
				(2.03)		
H5c: NEWOUTCEO					-0.6551	
					(-1.56)	
*TOTALGAP*NEWOUTCEO*					0.0472	
					(1.62)	
*H6: TOTALGAP*DUAL*						-0.0175
						(-1.60)
R^2	0.1828	0.2141	0.1895	0.2474	0.2250	0.2026
F-statistic	4.53 ***	8.81 ***	3.76 ***	6.31 ***	4.97 ***	3.73 ***
Observations (N)	161	161	161	161	161	161
Year dummies	yes	yes	yes	yes	yes	yes

App. 8: Moderated Fixed Effects Regressions of ROA

The table shows the fixed effects regressions of MTB on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year dummies (not shown) and firm fixed effects. The significance levels are denoted as follows: *$p < 0.10$, ** $p < 0.05$, ***$p < 0.01$.

Independent Variables	Dependent Variable: MTB					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	5.3394 *	4.3600 *	5.3796 *	4.5094 *	6.1201 *	4.3716 *
	(1.95)	(1.77)	(1.90)	(1.76)	(1.88)	(1.84)
TOTALGAP	0.1971 ***	0.2201 ***	0.2060 **	0.1805 ***	0.2019 ***	0.2331 ***
	(2.73)	(3.56)	(2.62)	(2.72)	(2.75)	(3.66)
SIZE	-0.7963 ***	-0.7426 ***	-0.8186 ***	-0.6802 **	-0.8912 ***	-0.7676 ***
	(-3.05)	(-2.94)	(-3.04)	(-2.56)	(-2.88)	(-3.17)
DUAL	0.0126	0.0283	-0.0102	-0.0294	0.0623	2.2597 *
	(0.07)	(0.18)	(-0.05)	(-0.21)	(0.31)	(1.78)
LEV	1.8960 ***	1.9634 ***	1.9095 ***	1.8968 ***	1.9672 ***	1.8308 ***
	(3.83)	(4.29)	(3.96)	(3.75)	(4.25)	(4.03)
CEOAGE	-0.0121	-0.0105	-0.0115	-0.0110	-0.0121	-0.0084
	(-1.54)	(-1.05)	(-1.41)	(-1.33)	(-1.49)	(-1.15)
VPNUMBER	-0.1590	-0.1483	-0.1603	-0.1852	-0.1645	-0.1471
	(-0.84)	(-0.82)	(-0.85)	(-1.04)	(-0.90)	(-0.81)
Moderating Factors						
H2: RETCEO		2.7041 ***				
		(4.11)				
TOTALGAP*RETCEO		-0.1805 ***				
		(-4.04)				
H3: NEWCEO			0.6512			
			(0.85)			
TOTALGAP*NEWCEO			-0.0437			
			(-0.85)			
H4: OUTCEO				-1.8410 *		
				(-1.87)		
TOTALGAP*OUTCEO				0.1174 *		
				(1.80)		
H5: NEWOUTCEO					4.1883 *	
					(1.73)	
TOTALGAP*NEWOUTCEO					-0.2822 *	
					(-1.72)	
H6: TOTALGAP*DUAL						-0.1514 *
						(-1.87)
R^2	0.5538	0.5697	0.5569	0.5602	0.5768	0.5746
F-statistic	17.80 ***	35.63 ***	14.26 ***	19.04 ***	13.26 ***	15.80 ***
Observations (N)	159	159	159	159	159	159
Year dummies	yes	yes	yes	yes	yes	yes

App. 9: Moderated Fixed Effects Regressions of MTB

The table shows the OLS regressions of industry-adjusted ROE on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year dummies (not shown). The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: Industry-adjusted ROE					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	-0.7143 ***	-0.7160 ***	-0.7789 **	-0.6191 **	-0.6576 ***	-0.8460 ***
	(-2.91)	(-2.79)	(-2.52)	(-2.39)	(-2.71)	(-2.90)
TOTALGAP	0.0536 **	0.0531 **	0.0586 **	0.0462 **	0.0456 **	0.0619 **
	(2.55)	(2.51)	(2.41)	(2.16)	(2.21)	(2.60)
SIZE	0.0240	0.0238	0.0234	0.0259	0.0298	0.0255
	(1.09)	(1.07)	(1.04)	(1.15)	(1.33)	(1.16)
DUAL	0.0079	0.0066	0.0021	0.0251	-0.0038	0.8627 *
	(0.18)	(0.15)	(0.04)	(0.51)	(-0.10)	(1.72)
LEV	-0.1786	-0.1793	-0.1802	-0.2010	-0.1486	-0.1886
	(-1.16)	(-1.16)	(-1.18)	(-1.20)	(-1.13)	(-1.22)
CEOAGE	-0.0029	-0.0026	-0.0029	-0.0033	-0.0030	-0.0025
	(-1.13)	(-0.87)	(-1.08)	(-1.37)	(-1.21)	(-0.98)
TMTCOUNT	-0.0442	-0.0458	-0.0451	-0.0413	-0.0431	-0.0495
	(-1.14)	(-1.15)	(-1.14)	(-1.06)	(-1.10)	(-1.25)
Moderating Factors						
RETCEO		-0.6219				
		(-0.89)				
*TOTALGAP*RETCEO*		0.0397				
		(0.85)				
NEWCEO			0.2915			
			(0.55)			
*TOTALGAP*NEWCEO*			-0.0196			
			(-0.52)			
OUTCEO				-0.1284		
				(-0.16)		
*TOTALGAP*OUTCEO*				0.0127		
				(0.24)		
NEWOUTCEO					-3.6399 **	
					(-2.59)	
*TOTALGAP*NEWOUTCEO*					0.2594 ***	
					(2.67)	
*TOTALGAP*DUAL*						-0.0553 *
						(-1.69)
R^2	0.1325	0.1338	0.1342	0.1478	0.1910	0.1415
F-statistic	1.69 *	1.68 *	1.54	1.69 *	2.19 **	1.67 *
Observations (N)	135	135	135	135	135	135
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

App. 10: Moderated Regressions of Industry-adjusted ROE on TOTALGAP

The table shows the results for the OLS regressions of industry-adjusted ROA on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year dummies (not shown). The significance levels are denoted as follows: $*p < 0.10$, $** p < 0.05$, $***p < 0.01$.

Independent Variables	Dependent Variable: Industry-adjusted ROA					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	-0.1986 *	-0.2285 *	-0.2626 *	-0.1942	-0.1857	-0.2504 **
	(-1.74)	(-1.92)	(-1.90)	(-1.60)	(-1.64)	(-2.01)
TOTALGAP	0.0140 *	0.0137 *	0.0193 **	0.0121	0.0120	0.0173 **
	(1.81)	(1.76)	(2.13)	(1.50)	(1.55)	(2.07)
SIZE	0.0219 *	0.0225 *	0.0217 *	0.0234 *	0.0234 **	0.0225 *
	(1.91)	(1.94)	(1.89)	(1.95)	(2.01)	(1.95)
DUAL	-0.0264	-0.0195	-0.0324 *	-0.0217	-0.0291 *	0.3100 *
	(-1.63)	(-1.19)	(-1.98)	(-1.22)	(-1.73)	(1.92)
LEV	-0.2095 ***	-0.2092 ***	-0.2131 ***	-0.2272 ***	-0.2038 ***	-0.2135 ***
	(-3.49)	(-3.48)	(-3.43)	(-3.39)	(-3.37)	(-3.50)
CEOAGE	-0.0014	-0.0007	-0.0015	-0.0013	-0.0014	-0.0012
	(-1.12)	(-0.49)	(-1.18)	(-1.16)	(-1.12)	(-1.01)
TMTCOUNT	-0.0276	-0.0309	-0.0291	-0.0257	-0.0270	-0.0297
	(-1.41)	(-1.53)	(-1.47)	(-1.35)	(-1.37)	(-1.51)
Moderating Factors						
RETCEO		0.0016				
		(0.01)				
*TOTALGAP*RETCEO*		-0.0026				
		(-0.16)				
NEWCEO			0.3125			
			(1.66)			
*TOTALGAP*NEWCEO*			-0.0216			
			(-1.64)			
OUTCEO				0.1821		
				(0.52)		
*TOTALGAP*OUTCEO*				-0.0104		
				(-0.45)		
NEWOUTCEO					-0.7458	
					(-1.48)	
*TOTALGAP*NEWOUTCEO*					0.0541	
					(1.49)	
*TOTALGAP*DUAL*						-0.0217 **
						(-2.06)
R^2	0.1946	0.2024	0.2026	0.2105	0.2091	0.2004
F-statistic	3.77 ***	3.42 ***	3.48 ***	3.47 ***	3.14 ***	4.36 ***
Observations (N)	135	135	135	135	135	135
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

App. 11: Moderated Regressions of Industry-adjusted ROA on TOTALGAP

The table shows the OLS regressions of industry-adjusted MTB on TOTALGAP and the moderating variables. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. All regressions contain year dummies (not shown). The significance levels are denoted as follows: *p < 0.10, ** p < 0.05, ***p < 0.01.

Independent Variables	Dependent Variable: Industry-adjusted MTB					
	BASIC MODEL	RETCEO	NEW-CEO	OUT-CEO	NEW-OUTCEO	DUAL
Intercept	-2.7438	-2.5923	-3.5093	-0.8050	-2.2835	-6.0032 *
	(-1.11)	(-1.05)	(-1.16)	(-0.31)	(-0.93)	(-1.95)
TOTALGAP	0.2573	0.2557	0.3182	0.2086	0.1888	0.4608 *
	(1.16)	(1.12)	(1.23)	(0.89)	(0.84)	(1.80)
SIZE	-0.1984	-0.2057	-0.2022	-0.2508 *	-0.1491	-0.1609
	(1.37)	(-1.39)	(-1.28)	(-1.79)	(-1.17)	(-1.10)
DUAL	-0.4857	-0.5734	-0.5585	-0.3890	-0.5668	20.0897 *
	(-0.96)	(-0.95)	(-1.08)	(-.077)	(-1.08)	(1.98)
LEV	4.0744 **	4.0831 **	4.0469 **	4.6846 **	4.2372 **	3.8573 **
	(2.12)	(2.09)	(2.10)	(2.27)	(2.15)	(2.13)
CEOAGE	0.0050	0.0037	0.0043	-0.0080	0.0051	0.0145
	(0.17)	(0.11)	(0.13)	(-0.27)	(0.17)	(0.50)
TMTCOUNT	-0.6154	-0.6181	-0.6330	-0.6712 *	-0.5859	-0.7535 *
	(-1.62)	(-1.64)	(-1.57)	(-1.75)	(-1.46)	(-1.95)
Moderating Factors						
RETCEO		-8.5247				
		(-0.78)				
TOTALGAP*RETCEO		0.5658				
		(0.81)				
NEWCEO			3.5370			
			(0.62)			
TOTALGAP*NEWCEO			-0.2428			
			(-0.58)			
OUTCEO				-14.6628 **		
				(-2.56)		
TOTALGAP*OUTCEO				0.9634 **		
				(2.50)		
NEWOUTCEO					-23.3085	
					(-1.44)	
TOTALGAP*NEWOUTCEO					1.7015	
					(1.44)	
TOTALGAP*DUAL						-1.3309 **
						(-2.04)
R^2	0.0956	0.0981	0.0977	0.1267	0.1277	0.1390
F-statistic	1.11	1.03	1.02	1.12	0.92	1.42
Observations (N)	133	133	133	133	133	133
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes

App. 12: Moderated Regressions of Industry-adjusted MTB on TOTALGAP

The table shows the variance inflation factors (VIFs) of the independent variables in the OLS regressions of ROE and ROA. VIF scores above 10 are commonly considered as indicators for the presence of multicollinearity issues.

Independent Variables	Dependent Variables: ROE, ROA				
	TOTALGAP	LTGAP	STGAP	CEOCOMP	TMTCOMP
TOTALGAP	2.31				
LTGAP		2.08			
STGAP			1.76		
CEOCOMP				2.65	
TMTCOMP					1.98
SIZE	2.33	2.66	2.10	2.68	2.46
DUAL	1.41	1.82	1.51	1.45	1.36
LEV	2.50	2.57	2.81	2.49	2.50
CEOAGE	1.82	1.68	1.64	1.77	1.67
TMTCOUNT	1.46	1.79	1.76	1.45	1.46
Observations (N)	168	131	141	168	168

App. 13: Variance Inflation Factors for Sample of ROE and ROA

The table shows the variance inflation factors (VIFs) of the independent variables in the OLS regression of MTB. VIF scores above 10 are commonly considered as indicators for the presence of multicollinearity issues.

Independent Variables	Dependent Variable: MTB				
	TOTALGAP	LTGAP	STGAP	CEOCOMP	TMTCOMP
TOTALGAP	2.31				
LTGAP		2.08			
STGAP			1.79		
CEOCOMP				2.64	
TMTCOMP					2.01
SIZE	2.32	2.66	2.09	2.67	2.47
DUAL	1.44	1.82	1.57	1.48	1.39
LEV	2.48	2.57	2.75	2.47	2.49
CEOAGE	1.88	1.68	1.67	1.84	1.79
TMTCOUNT	1.49	1.79	1.82	1.47	1.49
Observations (N)	166	131	139	166	166

App. 14: Variance Inflation Factors for Sample of MTB

Appendix C   **CDM Framework (Chapter 4.2)**

The table depicts the distribution of CEO compensation multiples for the basic sample of 168 observations. Percentiles indicate that the respective percentage of CEO compensation multiples is smaller than this value. Percentile 0 and 100 indicate the smallest and largest values for CEO compensation multiple in the sample.

Percentile (with respect to observations)	CEO Compensation Multiple
Percentile 0	1.12
Percentile 10	1.46
Percentile 20	1.71
Percentile 30	1.87
Percentile 40	2.04
Percentile 50 (Median)	2.27
Percentile 60	2.60
Percentile 70	3.01
Percentile 80	3.47
Percentile 90	4.25
Percentile 100	9.03
Mean	2.66
Observations (N)	168

App. 15: Percentile Distribution of CEO Compensation Multiples

The table shows OLS regressions of ROE, ROA and MTB on MULTIPLE, which denotes the CEO compensation multiple. The multiple is transformed by $(1/(\sqrt{x}))$. The multiple mean of the basic sample equals 2.64, which is used as the separating point for the two subsamples. Values of the t-statistics are indicated in parentheses and are based on heteroscedasticity robust standard errors. The significance levels are denoted as follows: *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Independent Variables	Basic sample			Sample (Multiple < Mean)			Sample (Multiple > Mean)		
	ROE	ROA	MTB	ROE	ROA	MTB	ROE	ROA	MTB
Intercept	0.4059 **	0.2520 ***	1.9854 ***	0.6633 **	0.2856 **	3.3519 **	0.0943	0.1554	2.9240 ***
	(2.25)	(2.84)	(3.12)	(2.36)	(2.41)	(2.54)	(0.53)	(1.62)	(2.90)
MULTIPLE	-0.2646 **	-0.1379 **	-0.6046	-0.4527 **	-0.1755 **	-0.6501	0.0630	-0.1902	0.5073
	(-2.60)	(-2.46)	(-1.60)	(-2.20)	(-2.11)	(-0.68)	(0.15)	(-0.80)	(0.40)
SIZE	0.0372 *	0.0220 **	-0.0348	0.0272	0.0155	0.0477	0.0231	0.0246	0.0105
	(1.83)	(2.08)	(-1.03)	(1.24)	(1.36)	(0.77)	(0.66)	(1.34)	(0.20)
DUAL	0.0087	-0.0202	0.0090	0.0118	-0.0161	0.1439	0.0398	-0.0156	0.1621
	(0.20)	(-1.33)	(0.07)	(0.14)	(-0.32)	(0.38)	(0.89)	(-0.84)	(0.87)
LEV	-0.1451	-0.1805 ***	0.3661	-0.1880 **	-0.1749 ***	-2.2194 ***	-0.1011	-0.1464 **	-0.7018 **
	(-0.94)	(-3.47)	(1.28)	(-2.00)	(-4.47)	(-6.54)	(-0.77)	(-2.56)	(-2.09)
CEOAGE	-0.0018	-0.0014	-0.0025	-0.0062 **	-0.0020 **	-0.0306 **	-0.0001	-0.0009	-0.0325 **
	(-0.79)	(-1.30)	(-0.36)	(-2.28)	(-2.28)	(-2.60)	(-0.05)	(-0.96)	(-2.58)
TMTCOUNT	-0.0466	-0.0294	-0.1142	0.0035	-0.0172	0.2105	-0.0457	-0.0304	-0.0310
	(-1.31)	(-1.61)	(-1.22)	(0.07)	(-0.69)	(1.31)	(-0.93)	(-1.09)	(-0.23)
R^2	0.2021	0.3030	0.5709	0.1867	0.2453	0.3411	0.0959	0.3128	0.2704
F-statistic	8.07 ***	17.73 ***	18.34 ***	3.95 ***	6.87 ***	6.52 ***	1.19	6.87 ***	2.57 **
Observations (N)	168	168	166	105	105	103	63	63	63
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	no	no	no	no	no	no

App. 16: Regressions of ROE, ROA and MTB on Compensation Multiple

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