Designing Management Compensation Systems

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An Analysis Based on Preference Similarity and Behavioral Economics

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Dissertation

zur Erlangung des Grades eines Doktors der

wirtschaftlichen Staatswissenschaften

(Dr. rer. pol.)

des Fachbereichs Rechts- und Wirtschaftswissenschaften

der Johannes Gutenberg-Universität Mainz

vorgelegt von

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in Mainz

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im Jahre 2020

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Abstract

The design of management compensation systems is an ever-present topic in corporate governance, with particular attention being accorded to designing compensation in such a way that managers and executives will act in the interests of the shareholders. The topic is not only subject to broad debate within the scientific community, indeed, it has also found itself under significant scrutiny in practice. Following company scandals such as that at Enron or, in general, the financial crisis of the previous decade, it is unsurprising that many have begun to harbor suspicions about the quality of current compensation systems and their viability. Together with a multitude of ambiguous empirical results, these scandals raise the question as to whether compensation systems should be designed based on agency-theoretical concepts only or whether they should be extended using additional perspectives such as elements stemming from behavioral economics.

The aim of this thesis was to provide recommendations for the design of management compensation systems by incorporating elements from behavioral economics to the discussion. First, recommendations based on the concept of preference similarity were made, and these were subsequently supplemented by recommendations derived from several concepts within the field of behavioral economics.

Based on the analysis of these concepts from behavioral economics it became evident that this field of research is not only capable of corroborating certain recommendations made by classical agency-theoretical concepts but that it can add multiple ones, too. In particular, it appears that a greater focus on human behavior and the differences between humans in different cultures are important elements that should help in designing compensation systems that are better suited than those currently in place.

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List of Variables

AI	Accounting income
$Amount$	Level of reward received
a, b	Modification factors of outer positive linear transformation
B	Bad agent type
$B_t(\cdot)$	Value of the assessment basis in time t
c	Capital charge
c, d	Modification factors of inner positive linear transformation
D	Value of paid dividend
$Delay$	Time between action taken and payout received
$D(\cdot)$	Utility in hyperbolic discounting
E	Book value of equity
EAT	Earnings after tax
$EBIAT$	Earnings before interest after tax
$Expectancy$	Weighs probability of outcome for an individual
E_{CPT}^{+}	Individually weighted expectancy of gains
E_{CPT}^{-}	Individually weighted expectancy of losses
e	Agent's effort
e^B	Agent's effort (bad type)
e^G	Agent's effort (good type)
e^H	Agent's effort (high)
e^L	Agent's effort (low)
G	Good agent type
$g(\cdot)$	Agent's disutility from expending effort
IC	Invested capital

i	Index
j	Index
k	Bad agent type's modification factor of good type's disutility of effort
k_{EC}	Capital costs of equity
k_{WACC}	Weighted average cost of capital
MC_{SOP}	Manager's reward when exercising a stock option
m	Fixed sum paid to the principal
NO	Net outflows to the shareholders
P	Profit of the company
p	Probability of occurrence
p^H	Probability of occurrence under high effort levels
p^L	Probability of occurrence under low effort levels
q	Probability of occurrence
q^G	Probability of good agent type/share in population of good agent type
R	Residual income
$Rate$	Frequency of an action leading to a reward
S_0	Base price of stock
S_T	Stock price at exercise date
$s(\cdot)$	Sharing rule between principal and agent regarding compensation
T	Exercise date
$T-t$	Delay in time between action and reward
t	Time index
$u(\cdot)$	Utility in prospect theory
$U(\cdot)$	Principal's utility
$Value$	Subjective evaluation of an outcome's level of reward

$V(\cdot)$	Agent's overall utility
$\underline{V}$	Agent's reservation utility
V_{CPT}^{+}	Individually weighted value of gains
V_{CPT}^{-}	Individually weighted value of losses
$v(\cdot)$	Agent's utility from monetary compensation
w	Agent's wage
w^B	Agent's wage (bad type)
w^G	Agent's wage (good type)
w^H	Agent's wage (high effort)
w^L	Agent's wage (low effort)
X	Set of all possible results
x	Company's result in the principal-agent relationship
x_{ti}	Cash flow of investment project i at time t
xVA	Any residual income concept
y	Decision results in prospect theory
Z	Constant
α	Function's departure from constant discounting
Γ	Impulsiveness
γ	Time preference parameter
γ_A	Time preferences of agent
γ_P	Time preferences of principal
δ	Discounting factor
θ	Random component resulting from exogenous factors
λ	Multiplier of the participation condition
μ	Multiplier of the incentive compatibility condition

$\Pi(\cdot)$	Principal's expected net profit
π	Transformation factor for decision weights
τ	Time index
$\varphi(\cdot)$	Overall utility in prospect theory

List of Abbreviations

CAPM	Capital Asset Pricing Model
CEO	Chief Executive Officer
CVA	Cash Value Added
EAT	Earnings After Tax
ERIC	Earnings less Riskfree Interest Charge
EVA	Economic Value Added
NPV	Net Present Value Identity
UE	Upper Echelons
WACC	Weighted Average Cost of Capital

1 Introduction

1.1 Problem and Objective

As a topic, management compensation has been the subject of intensive discussion for a long time. This continues to be the case today. The origins of management compensation stem from the separation of ownership and control that became necessary as companies became increasingly complex[1] and their ownership more dispersed. The solution to this is thought to be the delegation of the control over a company to external managers who are better qualified to do the job than the owners.[2] With more information and know-how at their fingertips, it is thought that managers can make better strategic decisions that allow for the successful performance of a company and the long-term improvement of its intrinsic value.[3] Although the idea is that a manager runs the company in the interests of the owners,[4] while the latter are interested in maximizing their utility through the maximization of the value of their company, the manager is interested in maximizing his[5] own utility.[6] Through the separation of ownership and control then, this conflict of interest based on the self-interest of the manager becomes pronounced as a result of his informational advantages compared to the owners. This in turn leads to information asymmetries. Indeed, even as far back as the 18th century, Adam Smith theorized about these conflicts: "The directors of such companies, however, being the managers rather of other people's money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own."[7]

Several methods are at the disposal of the owners to reduce the conflict of interest between themselves and the managers. These may extend to monitoring the activities of the latter or explicitly defining their permitted actions within a contract. However, monitoring all activities can be prohibitively costly and, given the vast complexity of

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1 See Berle/Means (1932), p. 119.
2 See Clarke (1998), p. 57; L'Huillier (2014), p. 302.
3 See Riegler (2000a), p. 146.
4 See Shleifer/Vishny (1997), pp. 740-741.
5 For reasons of simplicity and to improve readability, throughout this work the male form of an individual and a manager will be used. However, the terms individual and manager include both the male and the female form. In no way is this simplification supposed to give any indications about differing qualities of male or female managers and the male form used in this work can simply be exchanged with the female form without altering the validity of any statements made.
6 See Jensen/Meckling (1976), p. 312; Gillenkirch (1997), p. 15; Shleifer/Vishny (1997), p. 742; Jost (2001), p. 14.
7 Smith (2007), pp. 574-575.

managerial tasks, it is simply impossible to define guidelines in a contract for all potential actions of a manager under all circumstances and all environmental situations.

Potential resolutions to these problems are discussed within the realm of the agency theory which seeks to design contracts in a way that the conflicts of interest between managers and owners of a company are minimized. This is achieved by designing the contract in such a way that the manager will receive a reward when he acts in the interest of the owners. Most often, this is done through incentive systems within the compensation system of the management.[8] These compensation systems are highly complex constructs that, if not properly designed, may have an effect opposite to that which is intended and even exacerbate the already present conflict of interest. Several strands of agency theory have been established that deal with the proper construction of incentive systems in an owner-manager relationship, including the *base model of agency theory*, *preference similarity*, and *goal-congruence*. Based on elements from these models, scholars have made a variety of recommendations for the use of incentive systems in practice. To take one as an example, an element of compensation systems that rose to stardom in the 1990s, was the use of stock options—intended to encourage managers to act in the interests of the shareholders by giving them strong incentives to maximize the company's stock price and, in turn, the shareholder value.

However, in spite of the vast field of research and the compensation guidelines that emerged over time, management compensation remains a heated and controversially discussed topic. Of course, company scandals and bankruptcies such as those surrounding Enron, HealthSouth, Qwest or WorldCom have added fuel to the fire, and severely impaired shareholders' trust in a company's management and supervision.

Looking at the case of Enron, the company was seen as a prime example of sound corporate governance and a guardian of the shareholder value principle,[9] and made extensive use of stock options for its executives. However, critics like Healy and Palepu point out that the widespread use of short-term performance indicators and the strict focus on profit maximization within the management compensation schemes of Enron and others helped lead to their bankruptcies and crises. The authors make particular mention of how Enron's stock option programs failed to focus on mid- and long-term improvements in profits and shareholder value and instead promoted the

8 See Clarke (1998), p. 57; L'Huillier (2014), p. 302.
9 See Stout (2007), p. 806.

short-term enhancement of the stock's value.[10] Similar problems could also be found at HealthSouth and Qwest, where management compensation structures led to accounting fraud and insider trading.[11]All in all, these scandals demonstrated quite clearly that the conflict of interest between managers and shareholders remained unresolved and that improperly-employed measures within management compensation structures risked sacrificing long-term shareholder value in the attempt to achieve short-term improvements in a company's performance.

Further doubt on the correctness of management compensation structures was cast in the wake of the financial crisis of 2007/08. Not only did the crisis show that managers were prone to taking overly high risks to maximize their short-term compensation at the expense of the owners[12], it also sparked a public debate about why managers continued to receive high bonuses in the face of poor company performances.[13]

The company scandals and financial crisis have done more than to simply help cast doubt on the quality of current compensation systems. What they have also done is to call into question the assumptions made by classical agency theory. In this regard, some critics of agency-theoretical models criticize their assumptions as "[…] predictions that are not borne out by actual behavior […]."[14] Others have even attributed the occurrence of management scandals to financial agency theory,[15] claiming that the concept of agency theory "[…] still guides reforms for correcting the very problem it helped cause."[16]

In the wake of these doubts and the harsh criticism of the concepts behind the compensation systems, the importance of behavioral economics has grown. Behavioral economics attempts to incorporate findings from psychology into economic theory with the aim of improving predictions and recommendations made for practice. The concept itself is not new as it was already present at the times of Adam Smith who theorized about elements of behavioral economics.[17] Indeed, some authors deem it incredibly important to look at all aspects of the manager-shareholder relationship, including the psychological processes behind a manager's behavior. As Core, Guay, and

10 See Healy/Palepu (2003), p. 14.
11 See Agrawal/Cooper (2015), p. 170.
12 See Raible/Schmitt (2009), p. 249.
13 See Bauer /Arnold (2009), p. 717.
14 Slovic/Fischhoff/Lichtenstein (1977), p. 11.
15 See Kaufman/Englander (2005), p. 9.
16 Kaufman/Englander (2005), p. 9.
17 See e.g. Smith (2002), pp. 222, 249.

Larcker state, "[i]t is almost always necessary to understand the objectives of shareholders, the characteristics of managers, and other elements of the decision-making setting before drawing any conclusions about the desirability of […] equity-based incentive plans or the level of equity ownership by managers. Sweeping statements about governance and compensation, without a detailed contextual analysis, are almost always misleading."[18]

Based on the problems caused by financial scandals, the harsh criticism of agency theory, and the vast, resurgent field of behavioral economics that may offer answers to questions regarding management compensation, the present thesis's central question is how management compensation systems can be properly designed in consideration of the findings of behavioral economics and, with that, human nature.

This question will be answered by, first of all, establishing recommendations based on agency-theoretical concepts as a foundation and, subsequently, extending these recommendations through insights from behavioral economics. During the course of this work, several secondary research questions will be answered such as: What recommendations does preference similarity provide for the design of management compensation systems? What assessment basis and what compensation elements should be used? How does behavioral economics influence the recommendations made by preference similarity? How should the board of directors be structured and compensated to allow for a proper design of management compensation systems?

Ultimately, this thesis should provide a richer understanding of managerial behavior and an expanded picture of managerial compensation through the combination of agency-theoretical concepts and behavioral economics. Consequently, additional aspects will be introduced that will be of the utmost importance for designing compensation systems and that, to the knowledge of the author, have not together found their way into comprehensive recommendations regarding management compensation. These aspects will not only focus on the design itself but will also add further recommendations regarding the design of the environment in which the compensation will be set. The full list of concrete recommendations achieved by combining agency-theoretical concepts with behavioral economics has, to the knowledge of the author, not been attempted before. Overall, this thesis will provide recommendations that will act as a guideline for the design of proper management compensation systems in practice

[18] Core/Guay/Larcker (2003), p. 44.

and that are not only capable of reducing the conflicts between owners and managers but which can also prevent or at least minimize the potential for fraudulent actions and subsequent management and company scandals.

1.2 Structure of the Work

This work, including the introduction and the conclusion, consists of seven chapters. To answer the main question and achieve the objective expressed in the previous section, it is structured the following manner: *Chapter 2* lays the foundations for the necessity of utilizing incentive systems in a relationship between the owners of the company and its managers. Based on the basics of corporate governance introduced in *Section 2.1*, *Sections 2.2* and *2.3* then lay out two different views of corporate governance, namely the shareholder value and the stakeholder value concept. *Chapter 2.4* subsequently introduces the external and internal mechanisms that can be used as tools in the conflict of interest between managers and owners and also expounds the reasons for this work's focus on incentive systems.

Thereafter, *Chapter 3* introduces the basics of incentive systems. First of all, *Section 3.2* introduces the concepts of incentives, motivation, and incentive systems. The subsequent *Sections 3.3, 3.4,* and *3.5* then describe and characterize the components of incentive systems, namely its assessment basis, the types of compensation used, and the compensation function. Afterwards, *Section 3.6* introduces the basic requirements that are indispensable to any compensation system.

Chapter 4 then builds on the foundations of the previous chapters and make the recommendations for the design of compensation systems based on the concept of preference similarity. After a short introduction in *Section 4.*1, Section *4.2* sets the theoretical foundation for the normative-agency-theory approach by presenting the base model of agency theory. *Section 4.3* then elaborates on the usefulness of the base model of agency theory in the managerial realm, transferring the discussion to the approach of preference similarity which will consequently be analyzed in detail. The chapter also defines the requirements for preference-similar performance indicators which are then analyzed in *Section 4.4*. The following *Section 4.5* sets the recommendations based on the insights of Chapters 3 and 4, which are subsequently evaluated based on empirical findings in *Section 4.6*. *Section 4.7* then deals with the criticism of agency-theoretical concepts, concluding that further perspectives are necessary for a comprehensive picture of management compensation.

This extended perspective is provided by *Chapter 5*, which deals with behavioral economics in the realm of management compensation. *Section 5.1* first offers motivation for the use of behavioral economics and introduces the various behavioral elements which comprise *Sections 5.2* to *5.7*. These are Bounded Rationality in *Section 5.2*, Prospect Theory in *Section 5.3*, Hyperbolic Discounting and other time preference aspects in *Section 5.4*, motivational aspects including Intrinsic Motivation and Goal Setting in *Section 5.5*, Inequity Aversion in *Section 5.6*, and elements such as National Culture and Personality in *Section 5.7*. The findings of these sections are consequently presented in *Section 5.8*, which sets the recommendations for compensation systems based on behavioral economics.

Further potential practical problems that need to be integrated into the design of compensation systems are then presented in *Chapter 6*. For one, this is the pay-setting process in conjunction with the board presented in *Section 6.2* and the concept of career concerns that differentiates between the intentions of young and old managers in *Section 6.3*. The findings of these two potential problems are then summarized in *Chapter 6.4*.

This thesis closes with *Chapter 7*, the conclusion, which summarizes and combines the findings of Chapters 4, 5, and 6, providing a comprehensive overview of the design of management compensation systems as well as hinting at potential limitations that require further research.

2 Basics of Corporate Governance

2.1 The Concept of Corporate Governance

The concept of corporate governance goes back to the 1930s where it was used to describe the diverging interests between the owners and managers of a company. The main reason for this was traced back to the separation of ownership and control.[19] Of course, modern company structures mean that owners usually relinquish direct control over the company and delegate this to managers. The resulting conflicts are most often not only the result of diverging interests but also of information asymmetry between the two parties.[20]

At its core, corporate governance has the aim of promoting the achievement of a company's target.[21] This is achieved through the design of management and control systems with the intention of ensuring sustainable value creation.[22] However, there is a multitude of definitions for and interpretations of the design of corporate governance. Some of these have distinct differences and are, thus, used differently.[23]

Two concepts of corporate governance ascribe to it a similar task but with different parties. In these concepts, corporate governance is described as organizing the management and control of a company in such a way that there is a balance of interest between managers and, in the narrow definition, the owners (shareholders) or, in the wider definition, all different stakeholder groups (shareholders, debt capital providers, employees, customers, suppliers, government, and the general public).[24] The governance structure itself is mainly determined by the national law, the structure of the product, capital, and labor markets as well as the executive and controlling bodies within the company.[25]

The narrow definition of corporate governance focuses solely on a conflict of interest between managers and shareholders.[26] This definition is based on the shareholder value concept which concentrates a company's goals on the financial interests of the

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19 See Berle/Means (1932), p. 119.
20 See Clarke (1998), p. 57; L'Huillier (2014), p. 302.
21 See Laux (2006a), p. 7.
22 See Elosge (2017), pp. 63-64.
23 See Clarke (1998), p. 57; L'Huillier (2014), p. 302.
24 See Witt (2001), p. 85; Thomsen/Conyon (2012), p. 5.
25 See Witt (2001), p. 85.
26 See Witt (2002), p. 41; Bress (2008), pp. 14-15.

shareholders.[27] Consequently, proponents of this definition such as Shleifer and Vishny describe corporate governance as those instruments that allow the shareholders to ensure that managers will act in the shareholders' interest.[28]

The wide definition focuses on the conflict of interest between the managers and a broad group of stakeholders. This definition is based on the stakeholder value concept which concentrates on balancing the interests of managers and all relevant stakeholders.[29] Proponents of the wider definition describe corporate governance as a concept that analyzes how and through which instruments the management can be influenced by the stakeholders of the company and how a balance of interest can be achieved.[30]

The two underlying concepts of the two different definitions will be discussed in the following two sections. Thereafter, it will become evident why this thesis opts to focus on the narrow definition of corporate governance throughout the remaining chapters.

2.2 The Shareholder Value Concept

A value-based strategy and, consequently, value-based management is one of the possible guiding principles of a company. An important element of this value-based orientation is the shareholder value concept. It requires that all corporate decisions and activities are in line with the interests of the shareholders, i.e. an increase in the market value of a company's equity.[31] The shareholder value concept is, therefore, the foundation for the narrow definition of corporate governance from the previous section.

The shareholder value concept focuses on the maximization of the intrinsic market value of equity (the shareholder value) through actions and strategic decisions by the management.[32] There are different models to measure the shareholder value, with these being based on the dividend discount model, discounted cash flow, or the share price.[33] If the shareholder value is measured based on the discounted cash flow the decision to carry out an investment is based on whether or not the net present value of its

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27 See Busse von Colbe (1997), p. 272; Speckbacher (1997), p. 630; Rappaport (1999), pp. 1-2; Riegler (2000a), p. 153; Gillenkirch/Velthuis (2003), p. 547; Laux (2006a), pp. 13-14.

28 See Shleifer/Vishny (1997), p. 738.

29 See Busse von Colbe (1997), p. 272; Jensen (2002), p. 236; Speckbacher (2004), pp. 1322-1323.

30 See Hoshi (1998), p. 847; Welge/Eulerich (2012), p. 7.

31 See Copeland/Koller/Murrin (1998), pp. 35-36; Eberhardt (1998), p. 115; Witt (2001), p. 86; Weißenberger (2003), p. 236; Velthuis/Wesner (2005), p. 1.

32 See Busse von Colbe (1997), p. 272; Eberhardt (1998), p. 109; Witt (2001), p. 86; Mohnen (2002), p. 7; Wolf/Körnert (2004), p. 650.

33 See Hill (1996), p. 413; Busse von Colbe (1997), pp. 274, 277; Rappaport (1999), p. 39; Witt (2001), p. 86; Gillenkirch/Velthuis (2003), p. 548.

discounted cash flows is higher than the initial costs of investment.[34]

When making decisions based on the shareholder value concept, the individual preferences of each shareholder are not explicitly incorporated into the decision-making process.[35] This is due to the fact that incorporating the individual utility of each and every shareholder into the decision problems is hardly feasible as, in general, every shareholder has the aim of maximizing his own expected utility based on his own individual income stream. He will evaluate his income stream based on his utility function which, for one, contains his individual time and risk preferences. For another, individual shareholders will have different goals, expectations regarding the future of the company, and different environments that will influence their thinking and acting and will also affect their individual utility functions. As the characteristics that influence the individual utility functions will vary in their distinctness, evaluating the utility a strategy provides for each individual cannot be made on a large scale without excessive expenditure of time and other resources. Moreover, it is difficult to imagine that a company would be able to obtain the precise utility function of each and every shareholder.[36]

The need to incorporate all shareholders' utility functions is, however, not necessary under the assumptions of complete and perfect capital markets. Under these assumptions, *Fisher's Separation Theorem* shows that investment decisions can be made independent of individual consumption preferences.[37] The maximization of the intrinsic market value of equity is, consequently, assumed to equal the individual utility maximization. This is due to the fact that the diverging preferences of the shareholders will be balanced through the capital market.[38] Whether or not the assumptions concerning the market are fulfilled in reality is subject to debate.[39] However, even incomplete and imperfect capital markets can allow for the maximization of intrinsic market value to be the unanimous goal. For this to hold, the proportional division of cash flows, as well as the spanning and competitivity conditions need to be fulfilled.[40]

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34 See Busse von Colbe (1997), p. 273.

35 See Speckbacher (1997), p. 630; Gillenkirch/Velthuis (2003), p. 547; Velthuis (2004a), p. 206.

36 See Speckbacher (1997), pp. 630-631.

37 See Fisher (1932); Velthuis (2004a), p. 213; Laux (2006a), p. 48.

38 See Speckbacher (1997), pp. 630-631; Velthuis (2004a), p. 213.

39 For a discussion on the fulfillment of the mentioned prerequisites, see Laux/Schabel (2009), pp. 206-218.

40 See Velthuis (2004a), pp. 213, 231, 232. The *spanning condition* requires that each cash flow can be reproduced on the capital market. The *competitivity condition* requires that the investment made is considerably small compared to the volume of the overall market so that it does not change its existing implicit prices.

Of course, the question remains as to why a company should follow the shareholder value concept. The shareholders of a company are only so-called residual claimants. This means that their share of a company's results is not specified in a contract but rather comprises the residual that remains after all other claims that are contractually defined, i.e. the claims of all other stakeholders, have been fulfilled.[41] Consequently, the shareholders' return on their invested capital is not fixed but rather uncertain.
Adding to the fact that the shareholders' claims are not contractually fixed, shareholders are also at risk of losing parts or even all of their invested capital. In the case of a company's bankruptcy, the shareholders' claims on their invested capital are only subordinate to all claims from creditors that are contractually fixed. If the remaining capital in the company is insufficient and, thus, cannot fulfill all claims, shareholders may only recover parts of their invested capital or nothing at all.[42] Subsequently, it can be said that shareholders provide the liable equity of the company. Therefore, shareholders bear the highest risk levels of any stakeholder of a company. On the other side, the remaining stakeholders can ensure the fulfillment of their claims through contracts.[43] These are the main reasons that lead proponents of the shareholder value theory to argue that a company's targets and activities should be guided by the interests of the shareholders.[44] Stakeholders will not be disregarded in this case as their claims will still be incorporated into the constraints of the company's maximizing problem when making strategic decisions.[45]

Another argument for the shareholder value orientation is provided by the globalized capital markets. Given today's high levels of capital mobility, intense competition, and the increased pressure of receiving an appropriate return on invested capital by the investors,[46] companies that do not align their targets and activities with the interests of shareholders run the risk of finding no further investors.[47] This is due to the fact that investors will only choose to invest in those companies that provide them with a proper return on capital. Also, companies that adhere to the shareholder value principle are

41 See Alchian/Demsetz (1972), pp. 782-783; Fama/Jensen (1983), pp. 302-303; Copeland/Koller/Murrin (1998), p. 57.
42 See Franke/Hax (2009), p. 5; Ortner (2017), p. 8.
43 See Gillenkirch/Velthuis (2003), pp. 547-548.
44 See Copeland/Koller/Murrin (1998), pp. 57-58; Schmidt/Weiß (2003), pp. 110, 114-115; Velthuis/Wesner (2005), p. 49.
45 See Busse von Colbe (1997), p. 272; Franke/Hax (2009), pp. 2-3.
46 See Young/O'Byrne (2001), pp. 5-8.
47 See Copeland/Koller/Murrin (1998), pp. 35-36, 53, 58-59; Mohnen (2002), p. 7.

the ones in which investors put their highest faith.[48] In a worst-case scenario, shareholders may even pull their capital out of a company if they do not expect a proper return on their investment. This of course would endanger its future operations and survival.[49]

2.3 The Stakeholder Value Concept

As Jensen and Meckling theorize, a company is "[…] a nexus for a complex set of contracts (written and unwritten) among disparate individuals […]."[50] While the shareholder value concept focuses solely on the interests of the shareholders, stakeholder value concepts concentrate on a broader range of stakeholders. Stakeholders include all entities that have a claim on the company, that support the company and which it, consequently, benefits from,[51] as well as "[…] any group or individual who can affect or is affected by the achievement of the organization's objectives."[52] The main group of stakeholders comprises shareholders, creditors, managers, employees, customers, and suppliers.[53] Further stakeholders include the media, the society, or the public interest.[54]

Proponents of the stakeholder value theory argue that due to the important societal role of big companies, a pure focus on the shareholders is not justifiable[55] and, therefore, advocate the extension of a company's maximization and decision problem in the direction of other stakeholders.[56] Consequently, managers should make decisions that take into account the interests of all the stakeholders of a company.[57] While certain arguments have been put forward for the incorporation of the interests of all stakeholders, other authors such as Donaldson and Preston caution against an overly broad definition of the group of stakeholders that should be taken into account. According to them, there is a difference to be made between "real" stakeholders that have both stakes and influence, and those that have stakes but no influence like job applicants, or those that have influence but no stake such as the media. Based on their arguments, only

48 See Schmidt/Weiß (2003), pp. 114-115.
49 See Eberhardt (1998), pp. 113-114, 116; Rappaport (1999), pp. 8-9, Young/O'Byrne (2001), pp. 13-15.
50 Jensen (1983), p. 326 based on Jensen/Meckling (1976), pp. 310-311.
51 See Freeman (1984), pp. 25, 31; Schmidt/Weiß (2003), p. 110.
52 Freeman (1984), p. 46.
53 See Mitroff (1983), p. 33; Hill/Jones (1992), p. 133; Eberhardt (1998), pp. 171-172; Jensen (2002), p. 236; Schmidt/Weiß (2003), p. 110; Wolf/Körnert (2004), p. 651.
54 See Eberhardt (1998), pp. 171-172.
55 See Knyphausen (1992), p. 349.
56 See Gomez (1993), pp. 23-24.
57 See Eberhardt (1998), p. 145; Jensen (2002), p. 236; Speckbacher (2004), p. 1322.

"real" stakeholders and, thus, the main group as defined in the previous paragraph, should be considered in a stakeholder value concept.[58]

Furthermore, several authors criticize the assumption that all claims of non-shareholders are contractually fixed as is claimed by the shareholder value concept. According to them, stakeholders also have implicit claims like the specialized human capital of the employees or specialized machines for fabricating parts specifically for the company by suppliers. In the case of a company bankruptcy, the explicitly fixed contractual agreements will be fulfilled but, as they argue, the implicit ones are endangered and barely diversifiable in such cases.[59] Moreover, some authors argue that if shareholders take too much money out of the company implicit claims such as advanced employee training or specified customer support can no longer be properly fulfilled. As a consequence, the reputation of the company may suffer. This may cause the company difficulties as far as gaining further stakeholders or retaining current ones are concerned, leading to negative effects on the company's value in the long term.[60] Summing up the claims by the proponents of the stakeholder value theory, it can be said that not only shareholders but also other stakeholders carry a residual risk based on their implicit claims. Consequently, proponents of the stakeholder value theory hold that not incorporating the implicit claims of stakeholders into the maximization problem of the company gives rise to the threat of incorrect decision-making that will only become evident in the long term. This problem can be solved by defining the company's main target in a way that managerial activities and decision-making should achieve the best possible utility levels for as many stakeholders as possible.[61] For this reason, the maximization problem of the company should only maximize the company's value on the condition that the value of implicit claims is preserved.[62] To make sure that this condition is properly regarded, Witt suggests an institutional consideration of all stakeholders within the managerial and control systems of a company.[63]

The ideas and arguments made by proponents of the stakeholder value theory seem convincing, especially the claim that stakeholders other than shareholders also have implicit claims. However, the idea of considering the interests of all stakeholders, or

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58 See Donaldson/Preston (1995), p. 86.
59 See Cornell/Shapiro (1987), p. 6; Spremann (1996), p. 484; Speckbacher (1997), pp. 633-634.
60 See Cornell/Shapiro (1987), p. 6; Speckbacher (1997), p. 633; Eberhardt (1998), p. 142.
61 See Spremann (1996), pp. 484-485; Ferstl (2000), p. 59; Witt (2001), p. 104.
62 See Spremann (1996), p. 487.
63 See Witt (2001), p. 104.

at least the main group of stakeholders, leads to several, serious problems: For one, it allows the management to play off the various interests of the distinct groups of stakeholders against each other. For example, management could justify certain uneconomical investment decisions by citing its responsibility to safeguard the jobs of normal employees.[64] Furthermore, it is not only prohibitively costly but almost impossible to determine the utility functions of the vast number of stakeholders. Indeed, the impossibility of properly considering the interests of all stakeholders in managerial decision-making has already been demonstrated by Arrow's *General Possibility Theorem*.[65]
Besides, decision-making based on the stakeholder value theory would require the incorporation of qualitative targets into the managers' decision problems. These qualitative targets cannot be expressed by quantitative measures and, thus, are not properly quantifiable. In addition, targets and interests can vary even within a single stakeholder group and current concepts of stakeholder theory do not offer any possibilities or practically usable mechanisms that allow managers to solve these conflicts of interest.[66] Likewise, selecting the groups of stakeholders whose implicit claims would be incorporated into the maximization problem's constraint is highly subjective and non-transparent.[67] If it were not for the lack of practically usable mechanisms, another problem would still remain: The additional, extremely high determination and control efforts necessary within the stakeholder value concept could lead to its rejection by the management.[68]

In sum, then, the basic idea behind the stakeholder value concept is reasonable—indeed, the emphasis on implicit claims by stakeholders other than shareholders is highly interesting. However, due to the immense complexity and prohibitively high costs of incorporating the interests and utility functions of a large group of stakeholders into the maximization problem as well as the lack of proper instruments to solve conflicts of interest between these groups, it is justifiable to use the shareholder value concept as the foundation for theorizing about the design of managerial compensation.
Without further elaboration of mechanisms that are able to solve conflicts of interest within the company's maximization problem and that allow for a less subjective selection of a representative group of stakeholders whose interests build the foundation

64 See Wenger (1989), pp. 168-169.
65 See Arrow (1966), pp. 46-60.
66 See Eberhardt (1998), pp. 181-184.
67 See Eberhardt (1998), pp. 181-182.
68 See Ferstl (2000), pp. 74-75.

of managerial decision-making, stakeholder value theory will be extremely difficult to put into practice.

2.4 Corporate Governance Mechanisms

2.4.1 Introduction

As established in Section 2.1, corporate governance deals with the organization of a company's management and control systems with the aim of integrating the company into its environment.[69] Consequently, corporate governance provides the combined legal and factual regulatory framework for the management and control of the company.[70] It also contains the structure of the company, business policies, and most importantly, internal and external management and control mechanisms.[71] External mechanisms depend on the disciplinary effect that stems from market mechanisms.[72] They can only be indirectly influenced by the company and are defined by its environment.[73] Examples of external market mechanisms are the managerial labor market and the capital market. Internal mechanisms are internal regulations completely set up by the company itself.[74] These internal mechanisms can be either controls or incentive systems.

2.4.2 External Mechanisms

2.4.2.1 Labor Market

The labor market is perhaps the most important external disciplining mechanism for managers. Over the course of their careers, managers will build up their reputation which will also influence their standing in the labor market. For top managers, their reputation is not only influenced by their actions but also by the media.[75] Depending on a manager's reputation he may receive a variety of job offers just as his reputation on the labor market also defines the level of pay that he can expect. Thus, reputation on the labor market has extremely high relevance for the future career chances of managers.[76]

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69 See Werder (2015), pp. 3-4.
70 See Werder (2009), p. 4.
71 See Elosge (2017), p. 63.
72 See Bertoni/Colombo/Croce (2013), pp. 366-367.
73 See Tirole (2001), pp. 2-3.
74 See Tirole (2001), pp. 2-3; Bertoni/Colombo/Croce (2013), pp. 366-367.
75 See Werder (2015), p. 17.
76 See Fama (1980), pp. 292-293.

When a company's development of its market value can be at least partially explained by the actions of a manager,[77] the labor market will act in the following way: If a manager acts in a manner that negatively influences his company's market value, his reputation will, consequently, fall, meaning he can expect fewer job offers and, in total, lower compensation should he decide to change the company in the future. As a result, the disciplining effect of the labor market can help to reduce a manager's incentives to act contrary to the interests of the shareholders by being opportunistic or acting fraudulently.[78] This, however, will only work if the present value of fraudulently acquired pay is lower than the present value of the expected reduction in pay in the future. Thus, while the labor market can limit certain elements of managerial behavior, it cannot fully exclude them.

2.4.2.2 Capital Market

The second external market mechanism is established through market controls. These consist of the interaction between supply and demand on the primary and secondary markets.[79]

On the primary market, the more profitable it is, the easier it is for a company to obtain capital. For example, a capital increase needs fewer new shares to achieve the same value when the share price of a company is higher. The more inefficient and, in turn, less profitable a company is, the lower its market value and also its share price will be, making it more expensive for the company to refinance itself.[80] This is the disciplining effect of the primary market which acts through the channel of ease of refinancing.

Meanwhile, the controlling effect on the secondary market goes back to the concept of the "market for corporate control" developed by Manne in the 1960s.[81] The idea behind this concept is that bad performances by the management lead to the selling off of shares, a subsequent reduction in the share price and the increased potential for a hostile takeover, which in turn can result in the management being substituted by another.[82] Better management teams are thought to continuously incorporate other companies into their portfolio by acquiring badly managed companies. The threat of losing a job through poor performances and the resulting hostile takeovers is thought to

[77] See Fama (1980), pp. 292-293.
[78] See Hirshleifer (1993), pp. 146-147; Francis et al. (2008), p. 110.
[79] See Werder (2015), p. 17.
[80] See Easterbrook (1984), p. 654.
[81] See Bültel (2011), p. 185.
[82] See Werder (2015), p. 17.

incentivize managers to employ actions that benefit the market value of their company.[83] Similar to the disciplining effect of the labor market, for the disciplining effect of the capital market to unfold, the development of the share price has to be strongly bound up with the actions and decisions of the management. Only in these cases will the management's poor performance negatively influence the share price and managers' jobs be threatened by the possibility of hostile takeovers.[84]

2.4.3 Internal Mechanisms

2.4.3.1 Person Controls, Culture Controls, Action Controls, and Result Controls

The internal mechanisms of corporate governance can be divided into four categories: person controls, culture controls, action controls, and result controls.

Person controls are based on employees controlling and motivating themselves. This is accomplished by properly training employees, giving them the resources they need for their job as well as a good work environment. Employees are expected to be more motivated than they would be without the provision of these three elements. Companies can profit from self-monitoring as the employee wants to do a good job to justify the resources the company spends on him.[85]

Cultural controls are supposed to encourage monitoring amongst a team or group of employees. These controls are especially effective in countries that have a more collectivist nature and where the members of the team or group have social or emotional ties to each other. Examples of cultural controls are codes of conduct that are designed to define the expected behavior within a company without the need to monitor these behaviors. Other elements might be group rewards which seek to ensure that a group will monitor itself and reprimand fraudulent behavior or the low motivation of single group members.[86]

Action controls are there to ensure that employees act in the interest of the shareholders. They focus on the actions performed by the employees and can be categorized by behavioral constraints, pre-action reviews, action accountability, and redundancy. Behavioral constraints are elements such as physical constraints (e.g. computer passwords or limited access to sensitive information), administrative constraints (e.g. restriction of decision-making authority) or the separation of duties (e.g. breaking up

[83] See Picot et al. (2012), pp. 347-348.
[84] See Manne (1965), pp. 112-113.
[85] See Merchant/Van der Stede (2012), p. 88.
[86] See Merchant/Van der Stede (2012), pp. 90-92.

tasks across several employees). Pre-action reviews supervise the action plans of employees while action accountability holds the employee accountable for his actions. In the latter, it is necessary to define acceptable actions, communicate these to the employees, monitor their actions, and reward good and punish bad actions. Redundancy is utilized by assigning more employees to a task than is normally necessary, thus, ensuring that the task will definitely be achieved.[87]

Result controls link the rewards an employee receives to his performance. The most known element of result controls are pay-for-performance systems. Of course, there are other rewards aside from monetary compensation. For example, Merchant and Van der Stede name elements such as job security, promotions, and autonomy.[88] Result controls ensure that the rewards are given to the best performing employees as they link the rewards to the actual results an employee obtains and not other elements like social connections. Through this structure, result controls influence decision-making and, when designed properly, promote the taking of decisions that are in the best interest of the shareholders.[89]

Overall, all four elements of control can help to ensure that employees act in the interests of shareholders. However, elements such as person controls and culture controls will vary heavily across companies and countries and cannot, on their own, be used to ensure shareholder value orientation. Action controls and result controls have higher chances of ensuring shareholder value orientation, however, which is why these are explored in greater detail in the next two sections.

2.4.3.2 Action Controls through Monitoring

The first internal mechanism of corporate governance upon which the present study focuses provides the shareholders of a company with information, monitoring, and decision rights that allow them to recognize risks within the company and try and reduce them based on their influence.[90] This mechanism is used to reduce the information asymmetry[91] between managers and shareholders. Monitoring can allow the shareholders to observe certain elements of a manager's behavior that were previously unobservable or provide them with information that allows them to determine a

87 See Merchant/Van der Stede (2012), pp. 81-84.
88 See Merchant/Van der Stede (2012), p. 29.
89 See Merchant/Van der Stede (2012), p. 30.
90 See Werder (2015), p. 17.
91 More information regarding the different types of information asymmetries will be provided in chapter 4.2.

manager's effort or quality of decision-making based on the results.[92] It is important to note that monitoring will only have an effect on the actions of a manager if the monitoring results have consequences for him and he will anticipate these and, thus, incorporate them into his decision-making.[93] Material or immaterial rewards or sanctions are the possible consequences stemming from monitoring and are normally not contractually fixed. Examples include promotions, dismissal, or repayment for damages.[94]

In Germany, an important role in controlling the management is played by the *Aufsichtsrat*. German companies are known for their dualistic structure which consists of the executive board that leads the operative business of the company and the *Aufsichtsrat* that monitors the activities of the executives.[95] This dualistic structure is meant to help balance the interests of managers and shareholders. [96] The *Aufsichtsrat* has four core competencies in the areas of monitoring, advice, appointment, and organization,[97] with the first three having the highest importance.[98] Thus, it not only selects, appoint, and dismisses executives, it also monitors their activities and decisions. [99] Due to the strong independence of the *Aufsichtsrat*, it is seen as having high capabilities for properly monitoring the executive board.[100]

In the United States, the structure is different from that in Germany and the managerial and monitoring functions are all united in a single board, the so-called board of directors.[101] It has the task "[…] to hire, fire, and compensate the top-level decision managers and to ratify and monitor important decisions."[102] Consequently, it is the board of directors that will monitor and discipline the managers.[103] Usually, the executive officers, so-called inside directors, will manage the company while the outside directors, often executives from other companies or large shareholders, will monitor their activities.[104]

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92 See Ortner (2017), pp. 17-18.
93 See Kiener (1990), p. 28.
94 See Ortner (2017), p. 18.
95 See Bleicher/Leberl/Paul (1989), pp. 44-45; Bleicher/Wagner (1993), p. 7.
96 See Bleicher/Paul (1986), p. 6.
97 See Schewe (2018), p. 161.
98 See Witt (2009), pp. 307, 313-315; Schewe (2018), pp. 166-167.
99 See Bültel (2011), p. 134.
100 See Nassauer (2000), p. 170.
101 See Bleicher/Wagner (1993), p. 7.
102 Fama/Jensen (1983), p. 311.
103 See Bleicher/Paul (1986), p. 6.
104 See Bleicher/Leberl/Paul (1988), p. 47; Bleicher/Wagner (1993), p. 10.

Installing monitoring as part of corporate governance can help to reduce the informational asymmetry between managers and shareholders. However, the effectiveness of monitoring the managers depends heavily on the context and the types of tasks the management has to do. In general, monitoring simple tasks is quite easy as the output produced by the monitored person can easily be used to infer his effort and quality of action. However, more complex tasks—which in fact extend to the majority of tasks with which managers are faced—cannot simply be monitored in the same way.[105] Normally, monitoring comprises the comparison between the actual and target values, where at least one of the two values is often time-consuming and costly to obtain.[106] Consequently, introducing monitoring is evaluated based on the benefits that they provide compared to the costs that they cause. Only if the benefits are higher than the costs is it sensible to introduce monitoring into the corporate governance of a company. In the main, the monitoring capabilities of the board are characterized by their *ex post* nature. Consequently, decisions by the management that the monitors evaluate as being too risky or that carry an excessively high potential for destroying shareholder value are often detected overly late. In these cases, the cancellation of investment projects or other strategic decisions can either be too late or prohibitively costly.[107]
Furthermore, as Kolb argues, while managers are continuously involved in the day-to-day business of a company, members of the *Aufsichtsrat* or outside directors are rather removed from them and generally receive in-depth information at their meetings. These meetings often take place on a monthly or even quarterly basis only. This means the executive board has a surplus of information as it makes the strategic decisions of the company, manages its financial records, and has direct contact with the company's employees. As a result, Kolb claims that the executive board can use this surplus of information to deceive the monitors, therefore rendering them rather toothless.[108]

Overall, monitoring can help to reduce the information asymmetry between managers and shareholders. However, on its own, it is not sufficient to properly reduce the conflict of interest inherent in the separation of ownership and control.

[105] See Kolb (2012), p. 28.
[106] See Laux (1990), pp. 4-5.
[107] See Elosge (2017), p. 80.
[108] See Kolb (2012), p. 28.

2.4.3.3 Result Controls through Incentive Systems

One additional mechanism of corporate governance that can help to counterbalance the weaknesses of action controls is the employment of incentives.[109] Contrary to monitoring, incentive systems have an *ex ante* character. Through the use of incentives, the managers are supposed to be incentivized to prioritize investment projects and strategic decisions that positively contribute to a company's main goal of maximizing the shareholder value.[110] Furthermore, incentive systems aim to prevent managers from utilizing actions that serve only their own interests and may be harmful to the shareholders. [111]

Given that incentive systems play a very important role in reducing the conflict of interest between managers and shareholders, and that their design is a highly complex matter in light of the many elements that need properly taking into account, this internal corporate governance mechanism is at the core of the following chapters of this thesis. The next three chapters provide a comprehensive overview of the theoretical elements behind the design of management compensation systems and also discuss the proper design of these systems.

[109] See Shleifer/Vishny (1997), p. 744; Kolb (2012), p. 28.
[110] See Elosge (2017), p. 70.
[111] See Eisenhardt (1989a), p. 58.

3 Basics of Incentive Systems' Design

3.1 Introduction

To obtain a good overview of compensation systems and allow for a proper understanding of the concepts introduced later in Chapter 4, this chapter introduces the basics and concepts of compensation systems. The chapter then presents the system's different components that need to be designed, namely the assessment basis, the different types of compensation elements, and the compensation function. Finally, the chapter provides an overview of the basic requirements when designing compensation systems.

3.2 Incentive Systems

Incentive systems comprise the sum of all purposefully set working conditions that, through the use of positive incentives or rewards, promote certain desired behaviors while curtailing undesired ones.[112] Therefore, incentive systems are supposed to motivate a manager to act in the interest of the company and, thus, in the interest of the shareholders. Ideally, an incentive system is designed in such a way that the manager will make strategic decisions that not only maximize his own utility but also that of the shareholders.[113]

To allow for an incentive system to promote managerial behavior in the interests of the shareholders, it must address the motives of the manager.[114] Once this is achieved, an incentive system will have three distinct functions: motivation, coordination, and selection.[115] First, through the *motivation function,* an incentive system will motivate the manager to increase his effort. This is an essential part, as there is assumed to be a positive correlation between the improved performance of the manager and improvements in utility for the shareholders.[116] Second, through the *coordination function,* strategic decisions by the manager will be coordinated and controlled. The goal attainment of a manager will be connected to that of the shareholders. Essentially, shareholders use incentive systems to ensure that the manager only takes strategic decisions

[112] See Wild (1973), p. 47.
[113] See Laux (2006a), p. 10.
[114] See Hax (1969), pp. 204-205.
[115] See Lindert (2001), p. 109.
[116] See Arrow (1986), p. 1184; Gillenkirch (2008), p. 8.

that are in the interest of both parties.[117] Third, the setting of incentive systems will significantly influence the attraction of highly qualified managers together with their retention within the company.[118] Thus, it will have a *selection function* which is extremely important as concerns the future performance of a company. The better the quality of a manager that can be attracted, the higher the likelihood of good company results and, subsequently, high levels of utility for the shareholders.

The centerpiece of an incentive system is, consequently, the use of incentives and their interaction with the achievement of organizational goals.[119] *Incentives* are defined as stimuli that activate a certain motive within an individual dependent on the current situation. Meanwhile, *motives* can be seen as relatively stable, positively evaluated and sought-after states that people strive to reach.[120]

Incentives can be intrinsic or extrinsic.[121] *Intrinsic incentives* comprise the striving of an individual towards garnering utility through the completion of tasks. *Extrinsic incentives* constitute the satisfaction of individual needs through a reward.[122] Extrinsic incentives within an incentive system can thus be described as material or immaterial compensation by the company for the willingness of the recipient to not only become a member of the company but also for his provision of time, energy, and other resources towards the realization of the company's goal.[123] Within an incentive system, managers are supposed to be rewarded with extrinsic incentives only when they act in the interest of the shareholders.[124] Concerning the target group, extrinsic incentives can either be individual- or group-based. [125] While group awards may have weaker incentive effects on the individual, they can act as a kind of cultural control mechanism, leading to the monitoring of team members by their colleagues.[126]

The *compensation system* is the part of the incentive system that is agreed upon by the manager and the shareholders through a contract. This contract ensures that the manager has contractual claims on the rewards that are defined within the compensation

[117] See Gillenkirch (1997), p. 6; Schwalbach (1999), p. 173; Riegler (2000a), p. 148; Hungenberg (2006), p. 353; Steiner/Landes (2017), p. 96.
[118] See Hahn/Willers (2006), p. 365.
[119] See Petersen (1989), p. 6; Pfaff (2007), p. 30.
[120] See Berthel/Becker (2013), p. 49.
[121] See Frey/Benz (2004), pp. 21-22.
[122] See Dahlhaus (2009), p. 127.
[123] See Frese (1980), pp. 286-287; Weber et al. (2017), p. 159.
[124] See Hax (1969), pp. 204-205.
[125] See Schanz (1996), p. 89.
[126] See Merchant/Van der Stede (2012), p. 383.

system.[127] A compensation system contains two elements of compensation: fixed compensation and variable compensation. The former ensures a minimum compensation that is required by the manager to sign his contract.[128] The latter is the part of the compensation that incentivizes the manager in the way that has been described in this section.[129] The contract also defines the dimensions of a compensation system. These consist of the *assessment basis*, the *type of compensation*, and the *compensation function* which defines the relation between the assessment basis and the manager's performance in terms of the level of reward he will receive.[130]

3.3 Assessment Basis

The *assessment basis* of a compensation system comprises the connection between the interests of the manager and shareholders. It defines which success components in the company are of the highest importance[131] and is the element that binds the utility of a manager and the targets of the company. It defines the standard by which the performance of the manager is measured and the magnitude of compensation is set.[132] Consequently, the manager evaluates his performance based on its effect on the assessment basis while the company evaluates his performance based on its effect on the company's goal attainment.[133] The task of the assessment basis is to resemble and reflect the goal attainment of the predefined goals of the manager and the fulfillment of his defined behavior standards. It needs to be measurable, assessable, and capable of being influenced by the manager through his acting.[134]

The assessment basis can comprise either only one performance measure or a multitude of them. It can be defined as an absolute or a relative measure depending on e.g., how important the relevant market environment is for the company. Where the relevant market environment is important for the company and the manager's performance is supposed to be assessed against competitive benchmarks, Dahlhaus suggests the use of a relative assessment basis.[135] Furthermore, the assessment basis can be based on

[127] See Laux (2006a), pp. 11, 33.
[128] See Hungenberg (2006), p. 358. Further information regarding this requirement can be found in chapter 4.2.
[129] See Hungenberg (2006), p. 358.
[130] See Laux (1990), p. 7; Wetjen (2015), p. 22.
[131] See Riegler (2000a), p. 152.
[132] See Laux (2006a), pp. 11, 24-27; Elosge (2017), p. 83; Weber et al. (2017), p. 163.
[133] See Riegler (2000a), p. 152; Riegler (2000b), p. 34.
[134] See Laux (1990), pp. 7-9; Riegler (2000b), pp. 32-33; Hungenberg (2006), pp. 359-360.
[135] See Dahlhaus (2009), p. 129. More on the type of assessment basis will be discussed in chapter 4.3.3.

either input- or output-oriented performance measures.[136]

Input-oriented performance measures assess the real performance of the manager and, therefore, are only useful when his activities can be observed. Additionally, it is necessary that his choice of activity can be observed. Consequently, input-oriented performance measures need a high level of information and, as a result, high-level controls which can only be achieved through the use of a comprehensive control system. Setting up such a control system is associated with very high costs. As managerial jobs are very complex, consist of a multitude of different tasks, and have a vast amount of actions the manager can choose from, using input-oriented performance measures for managers is barely feasible.[137]

Output-oriented performance measures, contrary to their input-oriented counterparts, are based on the observable success of the company and use it to deduce the performance of the manager. As the manager is evaluated and rewarded based on the company's performance, he will be interested in maximizing this through his actions. This allows the shareholders to reduce the level of controls required to a minimum.[138]

Based on the high costs that come with input-oriented performance measures and the fact that maximizing the shareholder value is at the core of a company's goals,[139] output-oriented performance measures are to be preferred for managerial compensation systems.

3.4 Types of Compensation

After laying the foundation on how the performance of a manager should be measured, the question remains as to how to incentivize and reward him. Compensation systems can comprise different types of compensations, namely intrinsic and extrinsic ones.[140]

Intrinsic incentives and compensation are based on the task that the manager carries out. The reward the manager receives is simply fulfilling the task and is, thus, fulfilling immaterial needs. *Extrinsic incentives and compensation* allow the manager to fulfill needs outside of his working space by providing him with rewards based on the fulfillment of tasks and his overall performance.[141] As rewarding a manager through

[136] See Winter (1996), pp. 15-16; Riegler (2000a), p. 152; Riegler (2000b), pp. 34-35.
[137] See Riegler (2000a), p. 152; Riegler (2000b), p. 34; Laux (2006a), p. 26; Weber et al. (2017), p. 164.
[138] See Riegler (2000b), pp. 34-35; Weber et al. (2017), pp. 164-165.
[139] See Ortner (2017), p. 32.
[140] See Petersen (1989), p. 5.
[141] See Galbraith (1977), pp. 243-245; Hahn (1988), p. 135; Becker (1990), pp. 9-10; Kossbiel (1994), p. 78; Laux/Liermann (2005), pp. 502-505; Hungenberg (2006), p. 358.

intrinsic incentives comes from within himself, shareholders can only incentivize him through extrinsic incentives. However, rewards can also be designed in such a way that they will boost intrinsic motivation. This will be shown in section 5.5.5.

Extrinsic incentives can be material or immaterial. *Immaterial incentives* such as prestige or the potential for promotion are highly complex and rely heavily on the individual that is rewarded.[142] They are very subjective and as they cannot be translated into monetary values, it is inconceivable that their worth for each individual can be measured.[143] This means that incorporating them into compensation systems is practically impossible.

Therefore, compensation systems focus on the use of material incentives which can be financial or non-financial.[144] Here, *financial rewards* in the form of money are preferred as they have a number of advantages. First, money allows the recipient to use it freely and, subsequently, utilize it to fulfill his own special needs. Second, monetary incentives can be used in a more flexible way compared to non-financial rewards like a company car or a private jet. It cannot only be used as a one-time bonus for special achievements but also as a continuous one for a manager's performance. Third, rewarding a manager with money has lower administrative expenditures compared to the previously mentioned examples of a company car or a private jet. Fourth, money also has symbolic value reflecting success and prestige, promoting an individual's self-worth.[145]

Consequently, this thesis will focus on extrinsic incentives and financial rewards.

3.5 The Compensation Function

The connection between the assessment basis and the reward the manager will receive is expressed within the *compensation function*. It describes the *fixed payments* the manager will obtain independent of his performance and also characterizes his *variable payment* through establishing the relationship between his goal attainment and the

[142] See Wälchli (1995), p. 132.
[143] See Staiger (2004), p. 261.
[144] See Kossbiel (1994), p. 78; Imberger (2003), p. 135; Hungenberg (2006), p. 358; Laux (2006a), pp. 24-25.
[145] See Imberger (2003), p. 135; Hungenberg (2006), pp. 358-359; Laux (2006a), pp. 24-25; Merchant/Van der Stede (2012), p. 380.

amount of reward he receives based on it.[146] Furthermore, the compensation function also defines the degree of risk-sharing between the manager and the shareholders.[147]

The compensation function has a motivational effect: Depending on the way it is designed, the effect of the incentive payment on the manager will vary.[148] As fixed incentives have no connection to the manager's performance and only variable incentives evaluate this aspect, the higher the share of variable payment, the higher the motivational effect of the compensation function.[149] The ratio of fixed and variable payment is also a selective element as it attracts different types of managers, just as it helps to retain them. In most cases, those that are highly qualified are more likely to apply for a job that has a higher share of variable payment than those with lower qualifications.[150]

The slope of the compensation function also needs to be designed as it decides on the relationship between the level of the assessment basis and the rewards the manager will receive. There are three different types of slopes that are distinguished: a proportional relationship, a progressive one, and a degressive one.[151] A *proportional relationship* is achieved through a linear compensation function. The compensation will rise at constant rates as the assessment basis rises. This type of relationship is the most common in practice. A *progressive relationship* is achieved through a convex compensation function where the rate at which the compensation increases will increase with the level of the assessment basis. It can be employed to incentivize a manager on an over-proportional level and can be utilized when further increases in the assessment basis are very difficult to achieve or require extremely high levels of effort.[152]

Compensation functions can also incorporate thresholds that limit the incentive zone in which the performance of the manager is connected to his payoffs. The utilization of a minimum threshold, the so-called "*floor*", can prevent the bonus from turning negative in case a manager misses his performance target. The use of floors within compensation systems is widespread due to the limitations of liabilities that severely

[146] See Becker (1987), p. 94; Kossbiel (1994), p. 78; Winter (1996), pp. 15-16; Riegler (2000a), p. 153; Riegler (2000b), p. 33; Imberger (2003), pp. 133-134; Hungenberg (2006), p. 360; Laux (2006a), pp. 24, 27.
[147] See Pfaff (2007), pp. 35-36.
[148] See Riegler (2000a), p. 153; Riegler (2000b), p. 33.
[149] See Hungenberg (2006), pp. 358-359.
[150] See Winter (1997), pp. 619-620.
[151] See Hahn/Willers (2006), p. 370; Weber et al. (2017), p. 167.
[152] See Weber et al. (2017), p. 167.

restrict the occurrence of negative bonuses.[153] However, the use of a floor can also lead to misincentives for the manager as there is no incentive to not reduce the performance further once the manager is below the floor near the end of the evaluation period. This may provide him with arguments to convince the board to reduce the target for the next year and, consequently, make it easier for him to reach the bonus in the future.[154]

Upper thresholds, so-called "*caps*", are also often used. They restrict the maximum amount of incentive payment a manager can receive. These caps make it possible to limit the occurrence of so-called windfall profits which can occur in cases of an overall market increase or other positive developments in the environment. As these increases are not the result of the manager's own performance, a cap can help to limit the payout to the manager in these situations.[155] Furthermore, caps are also employed to at least partially prevent individuals from fraudulently increasing the current-period performance at the expense of the long-term performance and being rewarded for it. Also, they may act as a safeguard for newly introduced compensation systems that may have been poorly designed.[156]

However, caps also have negative effects. For one, especially exceptional performances of the manager that were not influenced by the market's development can themselves lead to the cap being reached. This may prevent a proper valuation of the manager's extraordinary performance.[157]

As a manager's variable compensation comes close to the cap he also has little incentive to increase his performance any further as it would go unrewarded. Also, he could employ earnings management and shift profits into the next period where he will once again be rewarded for them.[158] The occurrence of earnings management can be made clear by a simple example: Assume that a manager is assessed based on his sales numbers and these have already exceeded the bonus cap for the current year. The manager now has a strong incentive to shift further sales into the next year or sell the products now and record their payment in the next year.

The misincentives that result from the use of caps and floors are also termed "perverse incentives" by authors like Kolb.[159]

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153 See Velthuis/Wesner (2005), p. 93; Weber et al. (2017), p. 168.
154 See Velthuis (2017), p. 68.
155 See Merchant/Van der Stede (2012), p. 378; Weber et al. (2017), p. 168.
156 See Merchant/Van der Stede (2012), p. 378.
157 See Weber et al. (2017), p. 168.
158 See Velthuis (2017), p. 68.
159 See Kolb (2012), p. 50.

Figure 1 below shows an example of a compensation function that is very common in practice. The function is designed in a way that the manager will not receive a bonus until his performance passes a certain predefined threshold where he will receive the so-called "hurdle bonus". Below that threshold, the manager receives no bonus and at the threshold, the bonus takes a discrete jump upwards. A similar threshold can also be found on higher levels of the manager's performance, the "bonus cap", which caps the maximum amount of bonus the manager can receive. Between the cap and the floor lies the so-called incentive zone. In the center of the incentive zone is a so-called target level that is expected from the manager and will give him the predefined target bonus. Around the target bonus, the manager's bonus will increase or decrease with his performance. In the case of *Figure 1*, this incentive zone is designed in a proportional manner and, thus, is linear. It could, however, also be concave or convex.

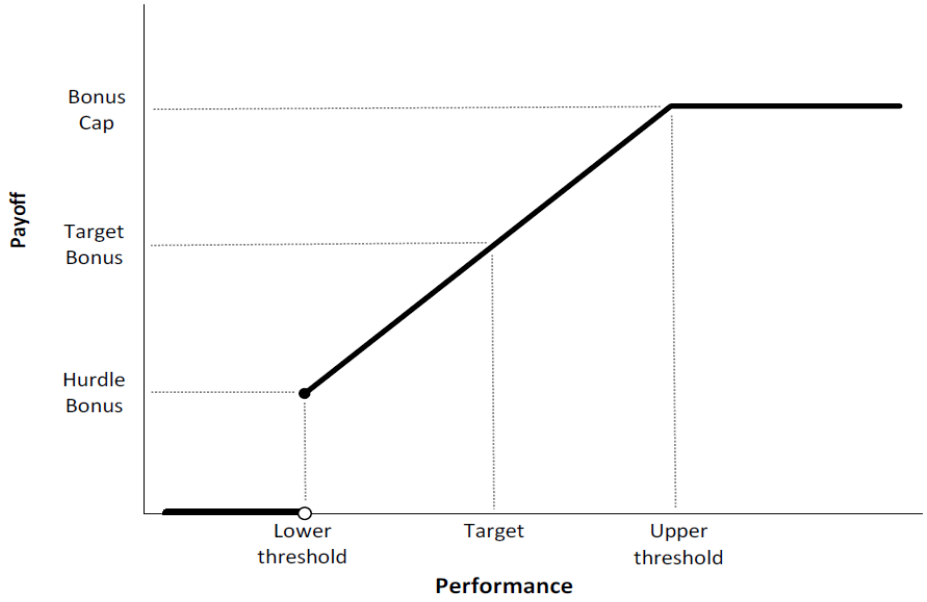

Figure 1: A Compensation Function and its Elements[160]

Optimally, a compensation function would only consist of the incentive zone and dismiss the use of caps or floors. However, due to the existence of limitations of liability, i.e. the inability of a company to introduce negative bonuses into a contract, the use of floors is inevitable. As this is the case, authors like Velthuis recommend the simultaneous use of caps to prevent the asymmetric treatment of risks[161] by insulating managers from windfall losses or general bad performance but allowing them to profit from windfall profits. Still, the compensation function should promote the incentive zone

[160] Graphic taken from Edmans/Gabaix/Jenter (2017), p. 158.
[161] See Velthuis (2017), p. 68.

and, subsequently, it should be as wide as possible, thus reducing the chances of the manager reaching the cap or the floor.[162]

3.6 Requirements of Compensation Systems

3.6.1 Introduction

The requirements of compensation systems introduced in this section are those that should be heeded within a compensation system. These requirements are there to ensure that compensation systems are accepted by the recipients and can be put into practice.

3.6.2 The Requirements

The most important requirement of a compensation system is the principle of *preference similarity.* It is used to align the financial interests of managers and shareholders and will constitute the main part of Chapter 4 of this thesis. Further information will be provided in Chapter 4.3.

S*implicity, comprehensibility,* and *transparency* are other important requirements. A compensation system can only have an incentivizing effect if it is understood by the manager. In particular, the understanding of the relationship between performance and reward is extremely important in order for the compensation system to positively motivate the manager. Additionally, *transparency* is another pillar of motivation that is required for all aspects of management compensation, including the assessment basis and performance evaluation. Transparency can be positively influenced by the design of the compensation function and through its public introduction and open use of the compensation system. Permanent access to the relevant information by the incentivized manager further improves transparency. All these components will reduce the possibility of a manager evaluating his performance differently to the compensation system. This will, subsequently, prevent unjustified demotivation.[163]

Another requirement that goes hand in hand with simplicity, comprehensibility, and transparency is *acceptance*. Clearly, a manager will only accept a compensation system when he understands how it works. Only when the compensation system and especially its assessment basis and compensation function are accepted by the targeted

[162] See Velthuis (2017), p. 68.

[163] See Spremann (1988), pp. 615-616; Becker (1990), p. 24; Pellens/Crasselt/Rockholtz (1998), p. 14; Riegler (2000a), p. 167; Mohnen (2002), p. 34; Imberger (2003), pp. 144-145; Van Herpen/Van Praag/Cools (2005), pp. 307-308; Velthuis/Wesner (2005), p. 55; Hungenberg (2006), p. 355; Laux (2006a), p. 32; Merchant/Van der Stede (2012), p. 39.

manager will the incentivizing function of the compensation system have an effect. If acceptance of the compensation system cannot be achieved, the motivational effect will either be suppressed or completely missing. In this regard, fairness and consistency of the compensation system are also of the utmost importance.[164]

The next requirements are those of *stability* and *flexibility*. Stability demands that the compensation system which is set up for the manager remains stable and unchanged over time. However, the compensation system should be flexible enough to react to developments in the market or the environment. Especially in the case of market downturns or negative shifts in the environment, agreed-upon targets may become unreachable for the manager through no fault of his own. This can potentially be demotivating and adjustments of the targets in such scenarios can allow the compensation system to maintain its motivating and incentivizing function.[165]

Another highly important requirement is *freedom from manipulation*. This requirement is especially important if the manager and shareholders have different time horizons, diverging time and risk preferences, or there are limitations of liability. In these cases, the manager may have incentives to manipulate his performance measures in such a way that it will grant him a financial advantage but may also lead to a financial disadvantage of the shareholders. This possibility would seriously hamper the incentivizing effect of the compensation system and could even lead to adverse effects. Consequently, a compensation system should optimally be designed without any possibilities for manipulation.[166]

A suggestion to severely reduce the manager's incentive for manipulation is the introduction of so-called claw back clauses. These clauses provide the company with the possibility of recovering rewards from a manager if, in the future, revisions of his performance provide evidence that he acted fraudulently to obtain the bonus.[167]

A further element that should be incorporated into compensation systems in cases of higher time preferences of the manager compared to those of the shareholders or limitations of liability is the principle of *smoothing*. Utilizing this principle allows for the

[164] See Pellens/Crasselt/Rockholtz (1998), p. 14; Riegler (2000a), p. 167; Imberger (2003), p. 146.
[165] See Laux (2006a), p. 31.
[166] See Küpper (1998), pp. 527-528; Mohnen (2002), pp. 21-23; Velthuis/Wesner (2005), p. 55; Laux (2006a), p. 90.
[167] See Jensen/Murphy/Wruck (2004), p. 13.

reduction in volatility of the manager's compensation over time.[168] This principle will be discussed in detail in Section 4.4.1.2.2.

Timeliness is another requirement that demands that the effect of a manager's actions on the performance measure should be accounted for as timely as possible.[169] Specifically, if the manager has a higher time preference than the shareholders, the requirement of timeliness is of the utmost importance. In this case, accounting for the performance in later periods can reduce the motivational effect of the incentive system. Additionally, there may be the risk that the manager will not properly connect the effect on the performance measure or rather the reward he receives with the actions that triggered it but rather with his current actions. Thus, the incentivizing effect of the compensation system will be reduced.[170]

When designing compensation systems, it should be kept in mind that there is a conflict between the principle of timeliness and the freedom from manipulation regarding the level and the distribution over time of the cash flows. When making investment decisions, the principle of timeliness would be achieved if the manager was evaluated based on the net present value of all additional investment projects he decided on in the current period. However, if the manager has a shorter time horizon or higher time preferences than the shareholders, he would be inclined to manipulate the timely distribution of the investment project's income so that it would be disclosed as soon as possible. This behavior would violate the principle of freedom from manipulation as the room for potential manipulative behavior under such conditions would be extremely large.[171] Consequently, when designing a compensation system, it is important to carefully balance the two conflicting requirements.

Another requirement is that of *intersubjective verifiability*, which is especially important for the assessment basis. It requires all elements of the compensation system to be observable and verifiable by the shareholders, the manager, and independent observers.[172] Violation of the intersubjective verifiability will result in significant monitoring costs which will be higher than the benefits of the installed compensation

[168] See Velthuis (2004c), p. 13; Velthuis/Wesner (2005), p. 144.
[169] See Hax (1989), pp. 162-163.
[170] See Merchant (1985), p. 26; Riegler (2000a), p. 166; Weißenberger (2003), pp. 82-83; Velthuis/Wesner (2005), p. 54; Laux (2006a), pp. 432-434, 438-440; Merchant/Van der Stede (2012), p. 39.
[171] See Laux (2006a), pp. 432-434, 438-440.
[172] See Spremann (1988), pp. 615-616; Gillenkirch (1997), p. 7; Laux/Liermann (2005), p. 509; Laux (2006a), pp. 27-28.

system. It is violated when either none or only some of the named parties can verify the manifestation of the assessment basis and when there is no clear rule regarding the connection between reward and assessment basis.[173]

Intersubjective verifiability is also a requirement for achieving freedom from manipulation. If it is violated and the level of the assessment basis can neither be observed nor verified accurately, the manager has an incentive to manipulate his performance measures. Similarly, this means that revisions of the manager's behavior will be harder to carry out and, subsequently, fraudulent behavior will be much harder to identify. This problem would make a claw back clause much less useful.[174]

Moreover, there is the requirement of *Pareto-efficient risk sharing*. Pareto-efficiency describes the state where it is impossible to redistribute resources in a way that makes one party better off without making the other party worse off. Pareto-efficient risk-sharing then describes the distribution of risk within a company between shareholders and the manager in a Pareto-efficient manner.[175] Optimally, a compensation system would exist to allow for Pareto-efficient risk sharing that would still motivate the manager to act in the interest of the shareholders.[176]

However, this requirement is in conflict with motivating the agent properly. In the case of a risk-averse manager and risk-neutral shareholders[177], the optimal solution would be to compensate the manager with fixed pay only. However, simply paying the manager on a fixed level will not motivate him to improve his performance on an extrinsic level.[178] This conflict and its solution will be further discussed in Sections 4.3.1 and 5.5.

A compensation system also needs to be *efficient* and *economical*. Of course, it only makes sense to install a proper compensation system if the benefits to shareholders exceed its costs. Benefits will come through the higher performance levels of a manager as he will be motivated and incentivized by the system. Furthermore, incentive

[173] See Laux (2006a), p. 27.
[174] See Dahlhaus (2009), p. 148.
[175] See Laux (2006a), pp. 29-30; Laux (2006b), p. 47.
[176] See Gillenkirch (1997), p. 32; Velthuis (2004a), p. 19; Laux (2006b), p. 47.
[177] Shareholders are generally assumed to be risk neutral. This is argued to be the case due to the possibility of them diversifying their portfolio which is often done in reality. Consequently, investors will only have a small share of their capital invested into a single company. As a result, shareholders are seen to be very close to being risk neutral. As Chiu and McKee argue, due to this diversification, shareholders want the company to take any risk that leads to a positive expected net present value. See Chiu/McKee (2015), pp. 5-6.
[178] See Laux (2006a), pp. 29-30.

payment helps to align the interests of shareholders and managers. The costs of a compensation system are clear and comprise the paid-out rewards to the manager as well as the administrative and control costs. Therefore, the more complex the compensation system is, e.g. through the use of numerous assessment bases and complex compensation functions, the higher its cost will be. Additionally, levels of complexity that are too high will also reduce the comprehensibility and simplicity of the compensation system and can, as a result, also reduce its benefits. Consequently, a compensation system should only be so complex that its benefits continue to outweigh its costs.[179]

Finally, another potential requirement is that of *controllability*. It would require the compensation system to contain only those elements that the manager himself can influence. This seems reasonable as a motivational effect will only unfold when the compensation of a manager can be influenced by his decisions. Following this line of argument, it should become evident that most performance measures not only track the activities of the manager, but are also influenced by other exogenous sources.[180] In order to still fulfill the principle of controllability, it would be necessary to eliminate all these external influences from the performance measure to clearly allow for only the manager's decisions to influence it. However, such an adjusted performance measure would leave out all other elements that are important to the success of the company. This would give the manager the incentive to disregard all developments of a company's environment when making his decisions. But disregarding these developments can have negative ramifications for a company and thus cannot be in the interest of the shareholders.[181] Consequently, controllability is not a necessary requirement and should not be incorporated into the design of compensation systems.[182]

[179] See Winter (1996), pp. 72-73; Pellens/Crasselt/Rockholtz (1998), p. 14; Riegler (2000a), pp. 164-165; Riegler (2000b), pp. 42-43; Mohnen (2002), p. 35; Imberger (2003), p. 148; Hungenberg (2006), p. 357; Laux (2006a), pp. 32-33; Merchant/Van der Stede (2012), p. 39.

[180] See Riegler (2000b), pp. 36-37.

[181] See Spremann (1988), pp. 615-616; Küpper (1998), p. 528; Riegler (2000b), pp. 36-37; Mohnen (2002), pp. 32-33; Van Herpen/Van Praag/Cools (2005), p. 308; Küpper (2013), pp. 319-320.

[182] See Jensen/Murphy/Wruck (2004), pp. 80-81.

4 Compensation Systems Under the Preference Similarity Approach

4.1 Introduction

Aside from the basic requirements of compensation systems, there are also a number of special requirements. This thesis will focus on the concept of preference similarity as the main anchor of its recommendations for the design of management compensation systems. First of all, this chapter sets out a foundation for the use of incentive contracts by analyzing contract relationships in a classical-agency-model framework. This is followed by an introduction to the concept of preference similarity, and a discussion that makes it clear why its concept is better suited to the management realm than the classical-agency-theory framework. The chapter then moves on to an analysis of the required properties for a preference-similar compensation system and, once complete, provides certain recommendations for its design. Following this, the chapter also analyzes the overall effectiveness of agency-theoretic compensation systems, accounting at the same time for criticism on the concepts of agency theory.

4.2 The Basics of Normative Agency Theory

4.2.1 Basics of Agency Theory

Over time, modern corporations have grown more and more complex. Corporations also now have many different shareholders among which a corporation's equity is shared. Shareholders usually lack the amount of information necessary to properly lead the corporation, thus, a company's business and its leadership have to be delegated to a manager who possesses the necessary knowledge to lead a corporation in the proper manner.[183] Of course, if there were no conflicts of interest between the shareholders and the manager, or if complete trust between the two parties existed then a contract would not be necessary and the manager would carry out his task in the interests of the shareholders. However, preferences between shareholders and managers tend to diverge: Shareholders are assumed to be interested in maximizing a corporation's value while managers try to maximize their own utility at the expense of the shareholders.[184]

[183] See Shleifer/Vishny (1997), p. 740.

[184] See Jensen/Meckling (1976), p. 312; Gillenkirch (1997), p. 15; Shleifer/Vishny (1997), p. 742; Jost (2001), p. 14.

Based on the idea that actors within the agency model are rational and want to maximize their own utility, agency theory analyzes the conflicts of interest that can arise within a contractual relationship between the shareholder (principal) and manager (agent) as well as the consequences that may follow from this. The analyzed interaction is referred to as the "agency dilemma" and deals with the problem of separation of ownership and control.[185]

The contractual relationship is characterized by the delegation of one or more tasks from the principal to the agent. Here, a contract is defined as an agreement between both parties that, in advance, defines all possible payouts and distributions of gains for all possible outcomes that can occur during the contractual relationship. The contract basically agrees on a compensation system that rewards the agent for his effort towards his assigned task.[186] The utility the principal derives from this contractual relationship depends on the decisions taken by the agent. Thus, the principal will want to design the contract in such a way that the agent will carry out the contracted task in the interest of the principal.[187]

As the agent has discretionary room when making decisions,[188] when designing a contract, the varying degrees of information to which the principal and agent have access are of particular importance. In the situation of information asymmetry where the agent has a surplus of information, the principal has to assume that the agent will act opportunistically, especially in situations characterized by uncertainty.[189] This means the principal has to assume that the agent will use every opportunity to act in his own interest. For example, the agent could proclaim that he carried out his task conscientiously by passing on false information.

Within the concept of agency theory, two concepts can be distinguished, a positive one and a normative one. Positive agency theory has a strong focus on empirical testing. Based on empirical results, it attempts to describe and explain how contracts between principal and agent should be designed. Meanwhile, normative agency theory relies on formal models to infer the optimal design of contracts between principal and agent in different situations.

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[185] See Shleifer/Vishny (1997), pp. 737-738, 740; Tirole (2006), pp. 15-16; Thomsen/Conyon (2012), pp. 5-6; Tricker (2015), pp. 59-62.
[186] See Macho-Stadler & Pérez-Castillo (2001), p. 5.
[187] See Jensen/Meckling (1976), p. 308; Arrow (1986), p. 1183; Pratt/Zeckhauser (1985), pp. 2-3.
[188] See Jost (2001), p. 13.
[189] See Ross (1973), pp. 134-135; Jensen/Meckling (1976), p. 309; Arrow (1985), p. 37; Imberger (2003), p. 89.

The normative agency theory has strong behavioral restrictions on human actions to prevent the models from becoming too complex. Therefore, results taken from normative agency theory can only partially portray reality. However, results gained from normative agency theory can be seen as the optimal design of contracts and real-world contracts should strive to mirror them as closely as possible.[190] The focus of the following section is on normative agency theory as it provides a basic understanding of a contractual relationship and has seen frequent use within the realm of compensation design.

Normative agency theory focuses on the problems in contract relationships which can be classified by the point in time an information asymmetry occurs.

For one, there are asymmetries that can occur *before the completion of a contract*. These asymmetries occur regarding the information about the agent's capabilities and are called *hidden characteristics*.[191] If the principal only offers the potential agents a contract with average conditions, there the likelihood is great that highly qualified individuals will not apply for the job. Consequently, the average quality of the remaining applicants is lower and the principal runs the risk of choosing a low-quality applicant. Furthermore, the principal might select a lower quality applicant who falsely claims to possess the characteristics that the principal wants. This is called *adverse selection*.[192] One possible remedy to this problem is called *signaling*: highly qualified agents will use signals like certificates to prove their qualifications and, thus, will reduce the level of information asymmetry. Another possibility is so-called *screening*, which comprises all potential measures the principal can employ to gather further information about the applicants which would allow him to reduce the information asymmetry.[193] A third possibility to reduce information asymmetries before the completion of a contract is *self-selection*. Here, the principal may offer different types of contracts to the applicants and allow them to choose their preferred contract option. Through this mechanism, the applicants will reveal their type and characteristics based on their choice.[194]

Information asymmetries can also occur *after the completion of the contract*. The

[190] See Jensen (1983), pp. 319-323; Eisenhardt (1989a), pp. 59-63.
[191] See Spence (1973), pp. 356-358; Spremann (1987), pp. 9-11; Küpper (2013), pp. 102-103; Schäfer (2013), p. 8.
[192] See Spremann (1990), pp. 574-576; Thomsen/Conyon (2012), pp. 21-23; Küpper (2013), pp. 102-103; Schäfer (2013), p. 8.
[193] See Spence (1973), pp. 355-356; Arrow (1985), p. 40; Jost (2001), p. 29; Macho-Stadler/Pérez-Castillo (2001), pp. 12-14; Küpper (2013), pp. 102-103.
[194] See Spremann (1987), p. 11; Küpper (2013), p. 103.

principal will not be able to simply observe an agent's information level or effort. The former type of asymmetry is called *hidden information*, the latter *hidden action*.[195] Knowing this informational advantage, the agent is likely to opportunistically use his informational advantage to act on his behalf and maximize his own utility. This behavior is called *moral hazard*.[196] Possibilities to reduce informational asymmetries after the completion of the contract and, thus, reduce the moral hazard can be achieved through *incentive or control systems* as part of corporate governance mechanisms (as seen in Section 2.4).[197]

To illustrate how a contract between a principal and an agent is designed, the following sections deal with principal-agent relationships. The following section (4.2.2) presents the base model of agency theory whereas the subsequent two sections (4.2.3 and 4.2.4) will focus on the two types of agency conflicts described above: the moral hazard and the adverse selection problem. All models presented here examine a relationship that consists of only one time period. Multi-period models do exist but the core results gained from a one-time relationship are sufficient for the ensuing sections.

4.2.2 The Base Model of Hidden Action

4.2.2.1 Description of the Situation

Overall, the principal-agent model portrays a conflict of interest between the principal and the agent: The principal is interested in the best possible execution of the task that he delegates to the agent. Meanwhile, the agent will incorporate costs that he incurs while executing the task into his own utility and will, therefore, try to maximize his compensation while accounting for the costs of carrying out the task. Consequently, he is interested in expending as little effort as feasible towards the assigned task.[198] The principal, therefore, has to consider the possibility that the agent will act in a way that is beneficial for himself but not for the principal. This conflict of interest combined with the uncertainty of the situation leads to incentive problems and problems of risk-sharing. To counterbalance these, the compensation system within the contract will have to be designed such that the agent will be influenced in his carrying-out of the task in a way that his decisions will mirror those that the principal would take himself.

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[195] See Arrow (1985), pp. 38-39; Thomsen/Conyon (2012), p. 21; Küpper (2013), pp. 103-104; Schäfer (2013), p. 9.

[196] See Arrow (1985), p. 38; Spremann (1990), p. 571; Tirole (2006), pp. 16-17; Thomsen/Conyon (2012), p. 21; Küpper (2013), pp. 103-104.

[197] See Arrow (1985), p. 38; Spremann (1990), p. 571; Tirole (2006), pp. 16-17; Thomsen/Conyon (2012), p. 21; Küpper (2013), pp. 103-104.

[198] See Jost (2001), p. 17; Schäfer (2013), p. 11.

Whether or not the principal can achieve this through the contract depends on the sharing of risk and gains between both parties. If the share of the agent is not large enough, the contract will not be able to influence his behavior properly.[199]

At the heart of the base model is a bilateral relationship that is established through a contract. The participants of the contract are the principal, who is responsible for designing and offering the contract, and the agent, who has to make the decision on whether he accepts the proposed contract or not. The relationship between principal and agent has a payoff which will be denoted as x. The set of all possible results is denoted as X. The final result x out of X depends on the effort the agent expends towards the task at hand and a random component resulting from exogenous factors stemming from the environment, θ. This random component is assumed to be non-observable.[200] In the literature, θ is often suppressed and the result x is modeled as a random variable. This modification will also be used here. Both the principal and the agent are assumed to have the same information concerning the random component affecting the result when signing the contract.[201]

Assuming that the possible set of results is finite, the probability of result x_i conditional on the agent's effort e can be written as:

$Prob[x = x_i|e] = p_i(e)$, for $i \in \{1,2, \dots, n\}$ and $\sum_{i=1}^{n} p_i(e) = 1$

$p_i(e) > 0$ for all e and i is assumed, meaning that no result can be excluded for any given effort level. Therefore, the principal cannot infer the agent's effort from the obtained result.

If there were no conflicts of interest between principal and agent, both would agree on a contract that induces the best possible strategy. Also, in a situation with no uncertainty, the principal could infer the agent's effort from the obtained result. However, in a state of uncertainty this changes and it is necessary to consider how both participants may react to risk. This reaction to risk is expressed in the respective utility functions and can be seen as a risk preference. The utility function itself is characterized as a von Neumann-Morgenstern type of function.[202]

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[199] See Jost (2001), p. 17.
[200] See Demougin/Jost (2001), p. 48; Schäfer (2013), p. 11.
[201] See Demougin/Jost (2001), p. 46; Macho-Stadler/Pérez-Castillo (2001), p. 17.
[202] See Demougin/Jost (2001), pp. 46-47; Macho-Stadler/Pérez-Castillo (2001), p. 18; Schäfer (2013), p. 12.

On the one hand, the principal contracts the agent to lead his company. He is interested in the agent performing his duties as well as possible. The principal receives the company's profit and pays the agent for his services. Thereby, the principal's utility is indirectly affected by the agent's effort. Consequently, his utility function can be expressed in the following way:[203]

$$U(x - w) \tag{4.1}$$

The principal receives his utility from the company's profits x minus the agent's wage w. His utility function is assumed to be concave, i.e. $U' > 0, U'' \leq 0$, indicating that he is either risk-neutral or risk-averse. As he receives the company's profits, he wants to maximize these while setting the agent's wage as low as possible.

His own utility is not directly dependent on the agent's efforts but, of course, the company's profits are influenced by them. Usually, it is assumed that higher effort levels lead to higher results. Consequently, the principal will want to make the agent's wages dependent on the company's performance in state i so that $w = w(x_i)$. Due to this, the agent has an incentive to show high levels of effort to improve the company's results if he himself wants to receive a higher wage. Therefore, the principal's utility can be written as:[204]

$$U\big(x_i - w(x_i)\big) \tag{4.2}$$

As the outcome of the company is uncertain, the following sections will express the principal's utility as an expected value over all possible states:

$$\sum_{i=1}^{n} p_i(e)\, U\big(x_i - w(x_i)\big)\ for\ i \in \{1,2, \dots, n\} \tag{4.3}$$

Here, it is assumed that the outcomes *x* are ordered by their size so that $x_1 < x_2 < \cdots < x_n$.

On the agent's side, the effort he expends is assumed to have costs for him and, consequently, will reduce the utility he receives from his wage provided by the principal. Thus, his utility function can be expressed in the following way:[205]

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[203] See Demougin/Jost (2001), p. 47; Macho-Stadler/Pérez-Castillo (2001), p. 18.
[204] See Macho-Stadler/Pérez-Castillo (2001), p. 18.
[205] See Demougin/Jost (2001), p. 47; Macho-Stadler/Pérez-Castillo (2001), p. 19; Schäfer (2013), p. 20.

$$V(w,e) = v(w(x)) - g(e) \tag{4.4}$$

The agent's utility function is assumed to be concave, i.e. $V' > 0, V'' \leq 0$, meaning that he is either risk-neutral or risk-averse. Additionally, it is additively separable in his wage (denoted by w) and his effort (denoted by e), resulting in a constant level of risk aversion.[206] The separability of the agent's utility function implies that the disutility he has from expending effort has no influence on his attitude to risk.[207] $v(w(x))$ expresses the utility from the monetary compensation of the agent while $g(e)$ represents his disutility based on his effort level. Contrary to the marginal utility of the agent's wages, his marginal disutility of effort is assumed to be linear or convex (either stable or increasing), i.e. $g'(\cdot) > 0, g''(\cdot) \geq 0$. Due to these characteristics of his utility function, the agent is interested in providing as little effort as possible while simultaneously receiving a high wage.[208]

The conflict of interest between the principal and the agent can be easily inferred from their different utility functions. The principal wants to maximize his utility by maximizing the company's profits. As these are dependent on the effort of the agent towards his task, the principal wants the agents to expend as much effort as possible while paying him as little as possible. Meanwhile, the agent is not primarily interested in the company's profits but rather wants to receive a wage as high as possible while providing as little effort as possible.[209]

Within the contract between the two parties, these two different perspectives will have to be brought together and the conflict of interest between principal and agent minimized. Here, the principal will offer the agent a non-negotiable contract which the agent can either accept or refuse. His decision is influenced by other contracting options that he has and their expected utilities. These are his outside options for the case that he would not accept the contract offered by the principal. Therefore, he will only accept the principal's offer if his expected utility is higher than or equal to the expected utility of his alternatives, his so-called reservation utility which will be denoted by $\underline{V}$.

[206] See Demougin/Jost (2001), p. 47; Macho-Stadler/Pérez-Castillo (2001), p. 19; Schäfer (2013), p. 11.
[207] See Schäfer (2013), p. 20.
[208] See Demougin/Jost (2001), p. 47; Macho-Stadler/Pérez-Castillo (2001), p. 19.
[209] See Demougin/Jost (2001), pp. 47-48; Macho-Stadler/Pérez-Castillo (2001), p. 19.

This condition is called the participation condition. Consequently, the agent will accept the principal's offer when:[210]

$$V(w,e) = v(w(x)) - g(e) \geq \underline{V} \tag{4.5}$$

Under uncertainty this so-called participation condition is expressed in the following way:

$$\sum_{i=1}^{n} p_i(e)\, V(w,e) = \sum_{i=1}^{n} p_i(e)\, v(w(x_i) - g(e) \geq \underline{V} \text{ for all } i \in \{1,2,\dots,n\} \tag{4.6}$$

The two parties' utility functions (4.3) and (4.6) will represent the basis for the following sections.

4.2.2.2 Symmetric Information

Within this section, it is assumed that principal and agent both have the same level of information, i.e. information symmetry, and that all of this information is verifiable. Additionally, the agent's effort is also assumed to be verifiable by the principal. The principal wants to maximize his own expected utility depicted in (4.3) but need not worry about any possible information asymmetries. Therefore, he will want to find the Pareto-efficient solution to his problem which minimizes the wages he pays to the agent. He needs to choose the effort level that he will demand from the agent and, subsequently, choose the agent's wage that fulfills his participation condition (4.6). The chosen effort level will subsequently be ensured within the contract through sufficiently high penalties in the form of direct high monetary penalties or potential lawsuits that will decide in favor of the principal. Should he accept the contract, the agent will therefore expend the contracted-upon level of effort. The principal's maximization problem can be expressed by incorporating (4.3) and (4.6) under uncertainty in the following way:[211]

$$\max_{[e,\{w(x_i)\}_{i=1,\dots,n}]} \sum_{i=1}^{n} p_i(e) U(x_i - w(x_i)) \tag{4.3}$$

s.t. (4.6)

[210] See Demougin/Jost (2001), p. 48; Macho-Stadler/Pérez-Castillo (2001), p. 20; Küpper (2013), p. 108; Schäfer (2013), p. 16.

[211] See Demougin/Jost (2001), p. 47; Macho-Stadler/Pérez-Castillo (2001), p. 21.

$$\sum_{i=1}^{n} p_i(e)v\big(w(x_i)\big) - g(e) \geq \underline{V}$$

As the outcome of the situation is uncertain, the maximization problem will incorporate the expected outcomes of the company profits and the agent's wages. Due to the incorporation of the participation condition as a restriction, the optimal level of wages the principal would pay the agent within this maximization problem is contingent on the agent's reservation utility $\underline{V}$.

As the principal's utility function (4.3) is concave, it will also be concave in wages paid. Also, the restriction of the maximization problem, the participation condition, is concave in wages as $v'(\cdot) > 0, v''(\cdot) \leq 0$. Thus, for the maximization problem, the Kuhn-Tucker conditions will be necessary and sufficient for finding the global maximum in wages.[212]

For effort, this cannot be stated as in the previous section the marginal disutility of effort was assumed not to be diminishing and, thus, not concave. Additionally, function (4.6) is weighted by the probabilities of different results which all are dependent on effort. Therefore, maximizing for effort is more difficult than for wages. In this example, effort will, therefore, be treated as a constant (e^O) and the maximization problem will focus on maximizing the principal's utility based on the wage $\{w^O(x_i)_{i=1,\dots,n}\}$ he will pay the agent.[213]

Using the Kuhn-Tucker conditions for the maximization problem, the first-order condition with respect to wages will be the following:

$$\frac{\partial L}{\partial w(x_i)}(w^O(x_i), e^O, \lambda^O) = -p_i(e^O)U'\big(x_i - w^O(x_i)\big) + \lambda^O p_i(e^O)v'\big(w^O(x_i)\big) = 0$$

Rewriting this first-order condition, λ^O, the multiplier of the participation condition, can be expressed as follows:

$$\lambda^O = \frac{U'\big(x_i - w^O(x_i)\big)}{v'\big(w^O(x_i)\big)}, \text{for all } i \in \{1,2,\dots,n\} \qquad (4.7)$$

As $U' > 0$ and $v' > 0$, it follows that λ^O must be strictly positive and, therefore, binding. If this were not the case the assumed requirements for the first-order conditions of

[212] See Macho-Stadler/Pérez-Castillo (2001), p. 22.
[213] See Demougin/Jost (2001), pp. 51-52; Macho-Stadler/Pérez-Castillo (2001), p. 22.

(4.3) and (4.6) would not be fulfilled.[214] If the participation condition were not binding the principal could offer the agent a contract with very low wages $w(x_i)$, which the agent would nevertheless still accept even if other offers would lead to higher expected utility. Intuitively this does not make sense and corroborates the fact that the participation condition has to be binding. Additionally, it is also argued that any wages that are higher than the agent's reservation utility would induce the agent to pay the principal to sign the contract. He would be willing to pay as much as the difference between the expected utility from the higher wages and the reservation utility and the principal would surely demand this.[215] Consequently, the payoff the agent would receive would be at the level of the wages of the participation condition.

As the aim of the contract between principal and agent is to create a Pareto-efficient situation, the ratio of marginal utilities depicted in equation (4.7) has to be constant. If this holds, Pareto-efficiency is achieved and neither participant can improve his utility without reducing the utility of the other.[216]

From this condition, one can infer the optimal distribution of risk among principal and agent. As the principal is usually assumed to be risk-neutral, his marginal utility will be constant, i.e. $U'(\cdot) = constant$. The agent, however, is modeled as risk-averse, i.e. $v''(\cdot) < 0$, so that a constant marginal utility can only be achieved if his utility does not change. Therefore, in this case, one can infer that $w^O(x_i) = w^O(x_j)$ in order to achieve $v'\left(w^O(x_i)\right) = v'\left(w^O(x_j)\right) = constant$. Thus, an optimal contract in a situation of symmetric information where the principal is risk-neutral and the agent risk-averse has to be designed in the following way: The agent will receive his wage independent of the result and only dependent on his effort while the principal will take on all company risk.[217]

This solution makes sense when it is recalled that, in the case of symmetric information, the principal does not have to solve an incentive problem so that the agent's wage need not contain an incentive component. Consequently, the risk-neutral principal should completely insure the agent against income risks. As the agent's wage influences the principal's profit negatively, he wants to pay the agent as little as possible.

[214] λ^0 could be 0, if $v' = +\infty$. However, this possibility is excluded in this example.
[215] See Demougin/Jost (2001), pp. 53-54; Macho-Stadler/Pérez-Castillo (2001), p. 23.
[216] See Macho-Stadler/Pérez-Castillo (2001), p. 23.
[217] See Schäfer (2013), p. 23.

He only has to make sure that the agent will accept the contract.[218] Therefore, the agent's wage, taking into account the participation condition, can be expressed as:

$$v(w^0) - g(e) = \underline{V}$$

$$\leftrightarrow w^O = v^{-1}(\underline{V} + g(e^O)) \tag{4.8}$$

As the agent's disutility of effort, $g(e)$, is a convex function increasing in e, this means that $\frac{\partial w}{\partial e} > 0$. The higher the effort level the principal demands from the agent, the more he will have to pay him.

In another case, it is assumed the principal is risk-averse and the agent risk-neutral, i.e. $v'(\cdot) = constant$. Here, for (4.7) to be constant, $U'\left(x_i - w^O(x_i)\right) = constant$. For a risk-averse principal this means that, similar to the risk-averse agent from the previous example, he will have to receive a fixed payment. Consequently, in this situation, the optimal contract will be the opposite of the previous one. It resembles the principal selling the agent the future profits of the company for the agent's reservation price. The principal will receive a fixed payment independent of the result while the agent will take on all company risk. Basically, the agent will insure the principal from any income risk.[219] As the agent is risk-neutral, the principal can efficiently compensate the agent without any loss in utility. The agent's wage would have the following structure:

$$w^O(x_i) = x_i - m \tag{4.9}$$

Consequently, he would keep the company's profits and pay the principal a fixed sum of m. As the principal once again wants to maximize his own income, he will want to receive a fixed sum that is as high as possible. As a result, m will be set so that the agent's remaining share of the expected profits will give him his reservation utility so that the participation condition is still fulfilled. Plugging equation (4.9) into the participation condition sets the following value for k:

$$\sum_{i=1}^{n} p_i(e^O)[x_i - m] = \underline{V} + g(e^O)$$

[218] See Demougin/Jost (2001), p. 52.
[219] See Macho-Stadler/Pérez-Castillo (2001), pp. 25-26; Schäfer (2013), p. 23.

$$\leftrightarrow m = \sum_{i=1}^{n} p_i(e^O)x_i - \underline{V} - g(e^O) \tag{4.10}$$

The principal will, therefore, receive a fixed sum that represents the difference between the expected profits from the company and the minimal amount required for the agent to accept the contract.

In the final case both participants, namely principal and agent, are assumed to be risk-averse. Here, both will share the risk of the company. The end result will depend on the degrees of risk aversion of principal and agent. If one of the participants has a higher risk aversion than the other, he will have a lower share of the risk and vice versa.[220]

Overall, the contract structures presented in this section show the optimal contracting in a principal-agent relationship. However, the case of symmetric information is highly unlikely within the real world. As described in the previous section, usually there is asymmetric information which often is in favor of the agent. The next two sections therefore deal with this issue and present two different models that address different types of information asymmetry. The first deals with the moral hazard problem and the second with adverse selection. In both cases, the optimal contract setting is not viable as the existence of asymmetric information leads the principal to take different measures to ensure that the agent will act on his behalf.

4.2.3 The Moral Hazard Problem

4.2.3.1 The Basics of the Moral Hazard Problem

In the case of the moral hazard problem, it is assumed that the principal does not have access to all necessary information about the agent at no cost.[221] When the agent's actions and especially his effort cannot be observed, the principal cannot contract the agent upon a fixed level of effort. One potential remedy for the principal, as discussed in Section 2.4.3.1, is to employ monitoring to properly observe the agent's effort. This information could, subsequently, be used within the contract. However, as also described in Section 2.4.3.1, an exhaustive level of monitoring is either impossible to achieve or prohibitively costly. Therefore, the Pareto-optimal solution shown in the

[220] See Macho-Stadler/Pérez-Castillo (2001), p. 26.
[221] See Holmström (1979), p. 74; Demougin/Jost (2001), p. 46.

previous section (the first-best solution) cannot be properly applied as it will not set the appropriate incentives for the agent.

As the first-best solution is not applicable in the case of unobservable actions, the principal has to resort to the second-best solution. This means he will have to use the available, imperfect information that he has in order to design a contract that properly incentivizes the agent. This second-best solution changes the degree of risk-sharing in order to set the proper incentives for the agent. Now the principal can no longer contract the agent upon a certain effort level but only suggest a certain effort he deems as optimal. Consequently, the contract has to be designed in such a way that the agent himself has an incentive to expend this suggested level of effort.[222]

The agent himself will make his choice of effort dependent upon the so-called incentive restriction/incentive compatibility constraint:[223]

$$e \in \arg\max_{\hat{e}} \{\sum_{i=1}^{n} p_i(\hat{e})v\big(w(x_i)\big) - g(\hat{e})\} \tag{4.11}$$

In other words, the agent will choose the effort level that will maximize his own utility (the utility from his expected wage minus the disutility from his chosen level of effort). This is the core of the moral hazard problem as it is not certain that the agent will choose the effort level suggested by the principal. If the contract now is properly designed, the agent's choice can be influenced in such a way that his chosen level of effort mirrors the one that the principal suggested within the contract. This is achieved by incorporating equation (4.11) into the principal's maximization problem. This incorporation will ensure that the contract will be set in such a way that the agent will expend the effort that the principal demands/anticipates.[224]

As was the case in the previous section, the agent will have to comply with his participation condition (4.6) and will, consequently, choose his effort level. The principal will incorporate this participation condition into the setting of his contract proposal. Equations (4.3), (4.6) and (4.11) will set up the following maximization problem for the principal when setting the contract:

[222] See Macho-Stadler/Pérez-Castillo (2001), pp. 39-40.
[223] See Demougin/Jost (2001), p. 48; Macho-Stadler/Pérez-Castillo (2001), p. 40; Küpper (2013), p. 107.
[224] See Macho-Stadler/Pérez-Castillo (2001), p. 40.

$$\max_{[e,\{w(x_i)\}_{i=1,\dots,n}]} \sum_{i=1}^{n} p_i(e)U(x_i - w(x_i)) \tag{4.3}$$

s.t.

$$\sum_{i=1}^{n} p_i(e)v\big(w(x_i)\big) - g(e) \geq \underline{V} \tag{4.6}$$

$$e \in \arg\max_{\hat{e}}\{\sum_{i=1}^{n} p_i(\hat{e})v\big(w(x_i)\big) - g(\hat{e})\} \tag{4.11}$$

For the sake of simplicity, the next section sets out to analyze a case in which the agent can choose between two different effort levels: a high effort level and a low effort level. This simplification still allows for a proper statement to be made on the design of compensation contracts under moral hazard.

4.2.3.2 Choosing Between Two Effort Levels

In this section, the moral hazard problem will be analyzed under two simplifications: two effort levels to choose from and a risk-neutral principal with a risk-averse agent.

Thus, the agent will not be able to choose between a large number of effort levels but will be restricted to choosing between a high effort level and a low effort level, i.e. $e \in \{e^H, e^L\}$. The principal normally prefers the agent to display a high effort level. As $g'(\cdot) > 0$, the disutility of effort is higher in the case of high effort than in the case of low effort: $g(e^H) > g(e^L)$. $p_i^H = p_i(e^H)$ denotes the probability of a company's result based on high effort from the agent and $p_i^L = p_i(e^L)$ denotes the probability based on low effort from the agent. Both are for all $i \in \{1,2,\dots,n\}$ and for all possible results the probabilities are greater than zero. Additionally, $\sum_{i=1}^{n} p_i^H = \sum_{i=1}^{n} p_i^L = 1$. As higher effort is connected with better productivity, p^H is assumed to first-order stochastically dominate p^L:[225]

$$\sum_{i=1}^{k} p_i^H < \sum_{i=1}^{k} p_i^L \text{ for all k } = 1,\dots,n-1$$

The first-order stochastic domination represents the circumstance that bad results have a higher probability of occurring when the agent expends low levels of effort as

[225] See Macho-Stadler/Pérez-Castillo (2001), p. 41.

productivity will also be lower in this case than where he expends high effort. Consequently, when the agent expends high effort, the expected result of the company is higher than when he expends low effort.

Under the assumptions of this section, a moral hazard problem will only arise if the principal demands a high level of effort from the agent. Otherwise, if the principal wanted the agent to expend low effort levels he would only have to distribute the risk optimally and ensure the participation of the agent. Consequently, he would simply need to pay the agent the fixed amount that was optimal under symmetric information based on the desired effort level.

However, in the case of the principal demanding the high effort level, a fixed payment will lead the agent to choose the low effort level as the principal cannot observe the agent's actions and the payment that the agent receives will not change based on the effort he chooses. The principal, therefore, has to design a different contract which will entice the agent to choose the high effort level. The contract has to be designed in such a way that the expected utility the agent receives for choosing the high effort level is higher than for choosing the low effort level, i.e. his gain in utility from his higher effort level is higher than the additional disutility from the higher effort level:[226]

$$\sum_{i=1}^{n} p_i^H v\big(w(x_i)\big) - g(e^H) \geq \sum_{i=1}^{n} p_i^L v\big(w(x_i)\big) - g(e^L)$$

$$\leftrightarrow \sum_{i=1}^{n} [p_i^H - p_i^L] v\big(w(x_i)\big) \geq g(e^H) - g(e^L) \qquad (4.12)$$

Combining equations (4.3), (4.6), and (4.12) under the condition that the principal wants the agent to choose the high effort level and, therefore, presumes the expected results of the company from the high-effort scenario, the maximization problem can be expressed in the following way:

$$\max_{\{w(x_i)\}_{i=1,\dots,n}} \sum_{i=1}^{n} p_i^H [x_i - w(x_i)] \qquad (4.3)$$

s.t. (4.6)

[226] See Demougin/Jost (2001), pp. 56-57; Macho-Stadler/Pérez-Castillo (2001), p. 42.

$$\sum_{i=1}^{n} p_i^H v\big(w(x_i)\big) - g(e^H) \geq \underline{V}$$

$$\sum_{i=1}^{n} [p_i^H - p_i^L] v\big(w(x_i)\big) \geq g(e^H) - g(e^L) \tag{4.12}$$

As was the case in the maximization problem for symmetric information, for this maximization problem the Kuhn-Tucker theorem is used. Setting and then differentiating the Lagrangean with respect to the wage $w(x_i)$ results in the first-order condition that can be reformulated to obtain:

$$\frac{p_i^H}{v'\big(w(x_i)\big)} = \lambda p_i^H + \mu[p_i^H - p_i^L] \text{ for all } i = 1, \dots, n \tag{4.13}$$

Restructuring (4.13) again by summing it up over all i shows that the participation constraint binds. As $\sum_{i=1}^{n} p_i^H = \sum_{i=1}^{n} p_i^L$, this leads to $\sum_{i=1}^{n} \mu[p_i^H - p_i^L] = 0$. Consequently, (4.13) can be rewritten as:

$$\lambda = \sum_{i=1}^{n} \frac{p_i^H}{v'(w(x_i))} > 0 \tag{4.14}$$

The multiplier of the participation constraint has to be greater than zero as all probabilities for all possible outcomes are assumed to be greater than zero and $v'\big(w(x_i)\big) > 0 < \infty$.

(4.13) can also be reformulated to prove that the incentive compatibility restriction also binds:

$$\frac{1}{v'(w(x_i))} = \lambda + \mu[1 - \frac{p_i^L}{p_i^H}] \text{ for all } i = 1, \dots, n \tag{4.15}$$

From this condition, one can infer that $\mu \neq 0$. If this were not the case and $\mu = 0$, (4.15) would indicate that $w(x_i)$ would have to be constant as $\frac{1}{u\prime(w(x_i))}$ under risk-aversion can only be constant when the wage does not change. However, it has already been discussed in this section that a constant wage will not lead the agent to choose the high effort level. Therefore, $\mu \neq 0$ but also $\mu > 0$ due to the Kuhn-Tucker conditions. This implies that the principal will not be able to obtain the same utility as in the

case of information symmetry. As the risk-averse agent will now have to bear risk, the principal will have to pay him a risk premium so as to still satisfy the participation condition, $w^H > w^*$. The moral hazard problem, therefore, has a positive cost for the principal compared to the situation with symmetric information.[227]

The results obtained from the maximization problem under moral hazard show how information asymmetry affects contracting in a principal-agent relationship. Instead of insuring the risk-averse agent from risk by paying him a fixed wage, the principal lets the agent participate in the risk to induce him to choose the high effort level. However, as incentivizing the agent to expend higher effort comes with additional costs, the principal will only use the incentive contract if the benefits from this higher effort surpass the additional costs of the risk premium. Otherwise, he would simply use the contract under symmetric information and expect the agent to expend low effort. Overall, it can be seen that this is only a second-best solution, however, introducing the first-best solution into a problem of information asymmetry is not viable if high effort levels are demanded by the principal.

Introducing a large discretionary number of effort levels from which the agent can choose or modeling effort as a continuous variable can be analyzed under the first-order approach. The conclusion obtained through this approach is the same as in the case of distinguishing between only two effort levels and therefore corroborates the conclusions drawn under the simplified assumptions of this chapter.

4.2.4 The Adverse Selection Problem

The second case of information asymmetry is the one that occurs due to hidden characteristics: the adverse selection. In this case, the principal is unable to properly evaluate the quality of applicants for the job he wants the agent to do.

In this section, the principal is once again risk-neutral while the agent can be either risk-averse or risk-neutral. The problem of adverse selection will occur independently of the agent's risk profile, i.e. whether he is risk-neutral or risk-averse and independent of his degree of risk aversion. Here, the principal faces the challenge of providing the proper contract to the right type of applicant.[228] The principal's expected net profit will be denoted as $\Pi(e)$ and is dependent on the effort e that the agent provides. The net profit function will be concave, i.e. $\Pi'(e) > 0$ and $\Pi''(e) < 0$.[229] Contrary to the

[227] See Demougin/Jost (2001), p. 57; Macho-Stadler/Pérez-Castillo (2001), p. 44.
[228] See Demougin/Jost (2001), p. 68; Macho-Stadler/Pérez-Castillo (2001), p. 116.
[229] See Macho-Stadler/Pérez-Castillo (2001), p. 106.

previous section where the principal could not verify the agent's effort, it is assumed that he is now able to do so. The principal will pay the agent a wage w so that his utility function can be expressed as:

$$U(e,w) = \Pi(e) - w \tag{4.16}$$

The applicants for the job that the principal offers can be one of two types (good denoted as G, bad denoted as B), with the probability of a good type applying/his share of the population being denoted with q^G and the probability of a bad type/his share of the population being denoted with $1 - q^G$. The types can be distinguished by the level of disutility they perceive from a given effort level, i.e. $g_G(e) < g_B(e)$. The bad type's disutility can also be expressed in the following way: $g_B(e) = k \cdot g_G(e)$ with $k > 1$. To exert the same effort levels, the two types would have to be paid differently: as the bad type has a higher disutility of effort he would demand a higher wage to expend the same amount of effort as the good type. Alternatively, given that the wage would be the same for both types, the bad type would expend lower levels of effort.[230] Thus, the utility for the two different types can be expressed in the following way:

$$V^G(w,e) = v(w) - g(e) \tag{4.17}$$

$$V^B(w,e) = v(w) - k \cdot g(e) \tag{4.18}$$

The principal cannot observe this difference in disutility and, therefore, cannot distinguish between the two types. If the principal could distinguish the two types of applicants, he would devise two contracts for the two different types like the ones in the case of symmetric information:[231]

$$\max_{[e,w]} \mathrm{U(e,w)} = \Pi(e^G) - w^G \tag{4.19}$$

s.t.

$$v(w^G) - g(e^G) \geq \underline{V} \tag{4.20}$$

and:

[230] See Macho-Stadler/Pérez-Castillo (2001), p. 106.
[231] See Demougin/Jost (2001), p. 69.

$$\max_{[e,w]} \mathrm{U}(\mathrm{e},\mathrm{w}) = \Pi(e^B) - w^B \tag{4.21}$$

s.t.

$$v(w^B) - k \cdot g(e^B) \geq \underline{V} \tag{4.22}$$

He would set both contracts in such a way that the participation conditions of both the good and the bad type are fulfilled. Thus, the optimal contracts for the good and the bad type would be characterized in the following way:

$$v\left(w^{G^*}\right) - g\left(e^{G^*}\right) = \underline{V} \tag{4.23}$$

$$\Pi'\left(e^{G^*}\right) = \frac{g'(e^{G^*})}{v'(w^{G^*})} \tag{4.24}$$

and for the bad type:

$$v\left(w^{B^*}\right) - k \cdot g\left(e^{B^*}\right) = \underline{V} \tag{4.25}$$

$$\Pi'\left(e^{B^*}\right) = \frac{k \cdot g'(e^{B^*})}{v'(w^{B^*})} \tag{4.26}$$

(4.24) and (4.26) are the so-called efficiency conditions that set the optimal effort levels for both types. Additionally, they ensure that the marginal rates of substitution of effort and wage are the same for the agent and the principal.[232]

The principal will demand a higher level of effort from the good type as it is cheaper for him. The bad type would demand a higher wage for the same level of effort as the good type as his participation condition suggests.

The contracts shown above can only be set when the principal knows the agents' types and can, therefore, offer each type a specific contract. However, where the principal does not know the type of applicants he cannot give them a specific contract. This would only be viable if the agents truthfully revealed their type when asked by the principal. Normally, the principal cannot expect the agents to truthfully report their private information. If he allowed the applicants to choose between the two contracts that were described above in the case of information symmetry, a problem would occur: As the principal cannot verify the type of the agent, the agent would not have to

[232] See Macho-Stadler/Pérez-Castillo (2001), p. 107.

fear any punishment for falsely reporting his type. Consequently, the bad type would still choose the contract that was designed for him, namely the contract that demands a lower effort level:[233]

$$V^B\left(w^{G^*}, e^{G^*}\right) = v\left(w^{G^*}\right) - k \cdot g\left(e^{G^*}\right) < v\left(w^{G^*}\right) - g\left(e^{G^*}\right) = \underline{V} = V^B(w^{B^*}, e^{B^*})$$

The good type, however, would not choose the contract designed for him, instead he would select the contract designed for the bad type. The contract's utility is based on the utility of the bad type and is designed in such a way that the utility the bad type receives from taking the job is as high as his reservation utility. The good type has the same reservation utility, therefore, choosing the contract for the bad type would give him the following utility:[234]

$$V^G\left(w^{B^*}, e^{B^*}\right) = v\left(w^{B^*}\right) - g\left(e^{B^*}\right) > v\left(w^{B^*}\right) - k \cdot g\left(e^{B^*}\right) = \underline{V} = V^G(w^{G^*}, e^{G^*})$$

As the good type's utility from picking the low effort contract is higher than the reservation utility, its utility is also higher than that from the high effort contract which has the same utility as the reservation utility.

Therefore, the principal cannot simply offer the same two different contracts designed for the good and the bad type as under symmetric information and allow the agents to choose the contract they want. Instead, he has several potential options.

First, he could offer just one single contract to the applicants independent of their type. However, doing so usually leads to lower expected profits for the company than when contracts are tailored to the different agent types.

Second, he could rely on the agents signaling their type through certificates and could then offer them the contract that suits them the best. However, agents can potentially manipulate these signals so that the principal may arrive at the wrong conclusion about the agents' type.

Third, the principal could only design one contract which is specifically geared towards the good type of applicant. In this case, the principal would design the contract as if it were the case of symmetric information. Of course, if no good type applied for the job and only bad types were available, nobody would accept the principal's contract offer and the principal would, therefore, be unable to delegate the task. Consequently, his expected profits would only be:

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[233] See Demougin/Jost (2001), pp. 72-73.

[234] See Demougin/Jost (2001), pp. 72-73; Macho-Stadler/Pérez-Castillo (2001), p. 108.

$$q^G[\Pi(e^{G^*}) - w^{G^*}] \tag{4.27}$$

The fourth option the principal has is to devise a menu of contracts and let the agents choose their preferred contract option. He has to devise this menu of contracts in such a way that the good type will choose the contract intended for him and the bad type the contract intended for him. This contract design adheres to the revelation principle: The contracts will be self-selective and are designed in such a way that all agents have a higher utility by truthfully reporting their type than they would if they lied about it. To properly design the menu of contracts, the principal has to incorporate the possibility of the agent lying or manipulating his signals into his maximization problem. He has to maximize the expected profits subject to the conditions that the contracts he will offer to the agents are designed so that each agent selects the contract for his own specific type.[235]

The bad type will receive a wage that gives him a utility equal to his reservation utility. The good type, on the other hand, will receive a surcharge to his reservation utility. This is necessary as the good type of agent has a lower disutility of effort and would receive a utility higher than the reservation utility if he were to choose the contract for the bad type. Consequently, the contract for the good type has to give him more than his reservation utility. The principal basically pays the good type to reveal his private information as regards his qualities. This is the reason why the surcharge to the reservation utility is called information rent.[236]

To decide on whether to offer a menu of contracts that allows the applicants to self-select or simply propose one contract that is solely focused on the good type, the principal will have to compare his profits in the case of the contract menu with his profits in the case of solely focusing on the good type from equation. As can be seen, he will offer the menu of contracts when:[237]

$$q^G[\Pi(e^G) - w^G] + (1 - q^G)[\Pi(e^B) - w^B] \geq q^G[\Pi(e^{G^*}) - w^{G^*}] \tag{4.28}$$

and vice versa.

[235] See Demougin/Jost (2001), p. 73; Macho-Stadler/Pérez-Castillo (2001), pp. 110-111.
[236] See Demougin/Jost (2001), p. 74.
[237] See Demougin/Jost (2001), p. 77.

4.2.5 Conclusion

Overall, the different models presented in Section 4.2 demonstrate just how important incentive contracts are, including why this is so. If the principal cannot verify the actions and the effort of the agent or if he does not possess all necessary information to assess the agent's quality, the results can be harmful as the agent will act in his own interest. Due to the conflict of interest and the information asymmetry between the principal and agent, optimal contracts cannot be used and second-best solutions have to be employed.

The contract structures shown in Section 4.2 are one method of designing incentive contracts. However, there are other options, one of which is to design contracts according to preference similarity. This will be presented in the following section.

4.3 Preference Similarity

4.3.1 Definition of Preference Similarity

The concept of preference similarity[238] states that contracts should be designed in such a way that the agent will always have a financial advantage (disadvantage) when his actions lead to financial advantages (disadvantages) for the principal.[239] This condition is commonly known as the "win-win condition".[240] It holds only if the manager participates in both financial gains and financial losses.

Preference similarity shares many characteristics with the models of agency theory presented in the Section 4.2. However, there are marked differences that heavily influence the recommendations and guidelines obtained through this concept. These differences are, amongst other things, due to the fact that preference similarity is only concerned with the financial components of utility and not with the non-financial ones that, within the classical models, lead to the problems of moral hazard and adverse selection.[241] Also, unlike optimal contracts, their preference-similar incentive

[238] Preference similarity goes back to Wilson (1968) and Wilson (1969) with further work being provided by Ross (1973) and Ross (1974). Preference similarity is closely related to the concept of *goal-congruence*. However, *goal-congruence* does not consider compensation costs and reduces the objective of the owner to solely be a function of gross cash flows. Regarding the differences between both concepts, see Gillenkirch/Schabel (2001); Mohnen (2002), pp. 29-32; Pfeiffer/Velthuis (2009), pp. 2, 8. Regarding the concept of *goal-congruence* see Gillenkirch/Schabel (2001); Mohnen (2002), pp. 23 – 29.

[239] See Velthuis (2004a), p. 23; Velthuis (2004c), pp. 10-11; Laux (2006b), pp. 72-73; Laux/Gillenkirch/Schenk-Mathes (2014), p. 364.

[240] See Velthuis (2004a), pp. 22-23; Laux (2006a), pp. 28, 231; Laux (2006b), p. 69; Laux/Gillenkirch/Schenk-Mathes (2014), p. 364.

[241] See Laux (2001a), p. 118; Velthuis (2004a), pp. 1, 4, 21, 22.

counterparts are not based on a maximization problem.[242] According to Velthuis, a disadvantage of the classical agency model is that the principal needs a high level of information regarding the possible actions of the agent to properly design a contract. This, as Velthuis states, is possible for tasks that have a well-defined range of possible actions the agent can undertake and that allow the principal to easily gather all the necessary information he needs when designing a contract.[243] In the realm of compensation systems for managers this condition is not fulfilled: Managers usually have a vast amount of possible actions that they can undertake, and their tasks are usually so complex that the principal cannot easily gather all the information he needs to design a contract within the classical concept of agency theory.

Preference similarity is capable of providing solutions for the agency problem for more complex tasks such as managerial jobs. The concept provides compensation systems that are designed in such a way that the utility functions of agent and principal will be similar regarding the actions the agent undertakes and, therefore, also similar regarding the results of the company. The sections regarding preference similarity in this thesis will concentrate on the concept of strict preference similarity by Laux.[244] Laux also devised another concept called partial preference similarity which deals with small changes in the company's results and its success. This concept is not the focus of this work, however.[245]

Within the model of strict preference similarity, there are some restrictions to be made. First, it is assumed that both principal and agent do not participate in any risky financial activities outside of their contractual relationship that depend on the company's results.[246] Second, both are assumed to have homogeneous expectations concerning the probabilities of the company's possible results.[247] Normally, due to information asymmetry, this would not be possible as the agent has better information and can, therefore, form better expectations regarding the company's possible results. However, as Laux states, this condition is similar to a situation where the principal assumes that the agent acts in the same way as he himself would if he had the same information as the agent.[248]

[242] See Ortner (2017), p. 50.
[243] See Velthuis (2004a), pp. 1-2.
[244] See Laux (2006b), pp. 72-74.
[245] For further information on partial preference similarity, see Laux (2006a), pp. 248-249; Laux (2006b), pp. 88-91.
[246] See Laux (2006b), pp. 71-72.
[247] See Laux (2006b), p. 72.
[248] See Laux (2006b), p. 73.

As this is exactly the aim of a preference-similar compensation system, this assumption can be adopted without a problem.

Similarity of the utility functions is achieved once these only differ in a positive linear transformation.[249] For the sharing rule to be valid for all possible probability distributions of the company's results and, therefore, under uncertain expectations, the sharing rule has to be set in such a way that the utility functions of principal and agent solely differ by a positive linear transformation.[250] This condition is fulfilled when the following relationship between the utilities of principal and agent holds for the established sharing rule:[251]

$$U[x - s(x)] = a \cdot V[s(x)] + b \qquad \forall x \tag{4.29}$$

If this condition is fulfilled, the decisions that maximize the agent's expected financial utility will also maximize the expected financial utility of the principal for any possible probabilistic distribution of the company's results. The compensation system, therefore, ensures that the manager will take those decisions that the principal himself would take if he himself were compensated by the same compensation system.[252] Therefore, a preference-similar compensation system that abides by this condition will ensure that the agent will receive a financial gain (loss) when the principal receives a financial gain (loss). Thus, the agent will decide in the interests of the principal and the problems regarding the financial aspects of a principal-agent relationship can be ameliorated.

One potential weakness that the concept of preference similarity has is its strict focus on the financial components of utility. The concept itself does not propagate that the non-financial components are meaningless and, as Laux states, without the non-financial conflict of interest, the principal could simply offer the agent the optimal contract under symmetric information. In the case of a risk-averse agent, a fixed payment would be sufficient.[253] However, where non-financial conflicts are present in the principal-agent relationship, compensation systems designed under preference similarity will not be able to achieve full unanimity between principal and agent. Despite this, Laux

[249] See Laux (2006b), p. 15; Ortner (2017), p. 51.
[250] See Velthuis (2004a), p. 23.
[251] See Wilson (1969), pp. 295-296; Laux (1998), pp. 120-121; Laux (2001a), p. 7; Laux (2006b), p. 74. For proof see: Velthuis (1998), pp. 21-23; Velthuis (2004a), p. 24.
[252] See Velthuis (2004a), pp. 1, 23-24; Pfeifer/Velthuis (2009), p. 20.
[253] See Laux (2006a), p. 25.

points out that designing a compensation system based on preference similarity would still be fruitful as it could at least ameliorate the financial conflicts and, therefore, reduce the overall conflict of interest between principal and agent.[254]

As a compensation system designed under preference similarity only focuses on the financial conflict, it is normally not the best possible compensation system available. Other compensation systems, such as those designed under the classical agency theory, may achieve higher expected utility for the principal as they focus on designing an optimal compensation system.[255] However, as pointed out above, designing compensation systems based on the classical agency theory has more weaknesses as far as complex tasks such as those carried out by a manager are concerned. Therefore, Velthuis holds that inducing the agent to mirror the financial interests of the principal as regards the company's result independent of changes to the environment is especially important in complex tasks.[256]

Based on the arguments listed in the previous paragraph, the following sections of Chapter 4 discuss how a compensation contract should be designed under preference similarity. Preference similarity itself has implications for the *assessment basis* and the overall *compensation function*, which will be discussed in these sections.

4.3.2 Preference Similar Compensation Function: Conflict between Preference Similarity and Pareto efficiency

As the concept of preference similarity has important implications for the design of the compensation function, one must look at how the compensation function should properly be designed. A problem that is present when designing contracts and especially the compensation function under preference similarity is the conflict between this concept and Pareto-efficiency. As Velthuis has shown, preference similarity and Pareto-efficiency can only be achieved simultaneously when the preference-similar compensation function is linear when the shareholders are assumed to be risk-neutral[257] and the manager to be risk-averse.[258] To underline this, Velthuis formulated a

[254] See Laux (2001a), pp. 118-119.
[255] See Velthuis (2004a), pp. 2, 242.
[256] See Velthuis (2004a), pp. 244-245.
[257] Shareholders are generally assumed to be risk neutral. This is argued to be the case due to the possibility of them diversifying their portfolio which is often done in reality. Consequently, investors will only have a small share of their capital invested into a single company. As a result, shareholders are seen to be very close to being risk neutral. As Chiu and McKee argue, due to this diversification, shareholders want the company to take any risk that leads to a positive expected net present value. See Chiu/McKee (2015), pp. 5-6.
[258] See Velthuis (1998), pp. 31-34.

theorem which states that preference similarity can only be achieved with a linear sharing rule when the utility functions of principal and agent are identical except for an outer and an inner linear transformation.[259] Therefore, the utility functions need to have the following relationship:

$$U[x - s(x)] = a \cdot V(c \cdot [x - s(x)] + d) + b \tag{4.30}$$

How such a relationship between the utility functions of principal and agent under a linear sharing rule can achieve preference similarity and Pareto-efficiency simultaneously can be explained in the following way: That the two utility functions only differ with regard to an outer linear transformation which fits the requirements of preference similarity.[260] However, there is still a difference due to the inner linear transformation. This can be countered by utilizing a linear compensation function.[261] Additionally, it must be pointed out that the utility functions of principal and agent are only allowed to differ as far as weighing the company's results is concerned. Thus, they already have to be similar before designing the contract.[262] This means that the risk preferences of principal and agent cannot differ in a way where, for example, one is risk-averse and one risk-neutral.[263]

This can be made very clear when assuming the case of a risk-neutral principal and a risk-averse agent. The employment of a preference similar compensation system as in Section 4.3.1 shows that the compensation function cannot always be linear and, therefore, a conflict exists between preference similarity and Pareto-efficiency.[264]
As seen in Section 4.2.2, the optimal, Pareto-efficient contract would pay the agent only a fixed amount, meaning that the first-order derivative would be zero. This, however, should not be employed when conflicts of interest are present as was shown in Sections 4.2.3 and 4.2.4. Then, the agent would have no incentive to act in the interests of the principal. On the contrary, a preference similar contract would lead to a convex sharing rule in these circumstances.[265] This convex sharing rule ensures that the marginal compensation of the agent rises when his marginal utility decreases. Therefore,

[259] See Velthuis (1998), p. 33.
[260] See Velthuis (2004a), pp. 28-29.
[261] See Velthuis (1998), p. 33.
[262] See Velthuis (2004a), p. 29.
[263] See Laux (2001a), p. 7; Laux (2006b), pp. 84-86; Laux/Gillenkirch/Schenk-Mathes (2014), p. 377.
[264] See Velthuis (1998), p. 31; Laux (2006a), p. 202; Laux (2006b), p. 85; Laux/Gillenkirch/Schenk-Mathes (2014), p. 376.
[265] For the derivation of this sharing rule in case of a risk-neutral principal and a risk-averse agent see: Laux/Gillenkirch/Schenk-Mathes (2014), p. 374.

the lower the agent's gain in utility for further improving the company's results, the higher his share in these improvements in results will be.[266]

As can be seen from the example in the previous paragraph, a linear compensation function for a risk-averse agent acting under a risk-neutral principal does not abide by the principle of preference similarity. However, the preference-similar compensation function which is convex cannot fulfill the principle of Pareto-efficiency.[267] This questions which of the two principles has higher importance and whether the compensation function should be designed in a preference-similar matter or in a Pareto-efficient one. According to Laux, this depends on the possibilities the principal has regarding the design of the contract and the possible incentives he can include: If the principal delegates well-defined tasks to the agent and if the tasks are of such a manner that the two parties' duties can easily be defined in the contract, Pareto-efficiency is more important than preference similarity.[268] These types of tasks are also suited to the classical agency framework as stated in Section 4.3.1.
If the agent, on the other side, is tasked by the principal to execute a cornucopia of complex tasks that can vary over time and are, therefore, difficult to control and difficult to be defined in the contract, preference similarity is of higher importance.[269]
Consequently, as this thesis deals with the design of management compensation systems, the focus on designing these compensation systems based on the principles of preference similarity is better suited than the focus on contract designs under classical agency theory.

Even though preference-similar sharing rules under the assumptions of a risk-averse agent and a risk-neutral principal (these are often assumed for the relationship between shareholder and manager) cannot fulfill the principle of Pareto-efficiency, Laux argues that they still allow for a satisfying level of risk-sharing through company-internal transactions on the capital market.[270] Importantly, as the analysis by Velthuis shows, in the case of a risk-averse agent and a risk-neutral principal, the sharing rule, that is to say, the compensation function, should still be convex but in as linear a manner as possible to achieve a risk-sharing level that is as similar as possible to that of Pareto-efficiency.[271]

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[266] See Velthuis (1998), p. 31.
[267] See Laux/Gillenkirch/Schenk-Mathes (2014), p. 377.
[268] See Laux (2006b), p. 87; Laux/Gillenkirch/Schenk-Mathes (2014), p. 379.
[269] See Laux (2006b), p. 87; Laux/Gillenkirch/Schenk-Mathes (2014), p. 379.
[270] See Laux (2006b), p. 87,
[271] See Velthuis (2004a), pp. 35-39.

4.3.3 Preference Similar Assessment Basis: Net Present Value Identity

Aside from the design of the compensation function, the assessment basis of the compensation system also needs to fulfill a certain criterion to adhere to the principle of preference similarity. This criterion is the principle of net present value (NPV) identity. Here, the present value of the performance measure has to equal the present value of the cash flows resulting from the investment projects a manager selected.[272] Only assessment bases that fulfill this criterion can be used for a preference-similar compensation system. This condition has been proven by Velthuis[273] and will be depicted based on his work in this chapter to show which performance measures should be used under preference similarity.

For this example, the interaction between principal and agent will only consist of two periods, $t \in \{0,1\}$, and the agent will be compensated based on the following sharing rule:[274]

$$s_t = s_t[B_t(x_0, x_1)] \tag{4.31}$$

Consequently, the agent is compensated based on the value of the assessment basis B_t that itself is influenced by the company's cash flows over the two periods. The cash flows of each period can consist of several components x_{ti} with $i \in \{0, \dots, n\}$. The way each cash-flow component influences the assessment basis can be expressed through the partial derivative:[275]

$$\frac{\partial B_\tau}{\partial x_{ti}}$$

with $\tau \in \{0,1\}$. If a cash flow component only influences the assessment basis in the period that it is recognized in, the partial derivatives for the different periods can be expressed as:

$$\frac{\partial B_t}{\partial x_{ti}} = 1 \tag{4.32}$$

and

[272] See Velthuis (2003), p. 120; Pfeiffer/Velthuis (2009), p. 20.
[273] See Velthuis (2004a), pp. 170-176.
[274] See Velthuis (2004a), p. 170; Pfeiffer/Velthuis (2009), p. 22.
[275] See Velthuis (2004a), pp. 170-171; Pfeiffer/Velthuis (2009), p. 22.

$$\frac{\partial B_\tau}{\partial x_{ti}} = 0 \tag{4.33}$$

for $\tau \neq t$.

Additionally, the utility functions of principal and agent depend on the sharing rule (4.31).[276] Applying the necessary condition for preference similarity from equation (4.29) to this problem and inserting (4.31) into it, the relationship between the utilities of principal and agent can be expressed in the following way:[277]

$$U[x_0 - s_0(B_0), x_1 - s_1(B_1)] = a \cdot V[s_0(B_0), s_1(B_1)] + b \tag{4.34}$$

with $s_t(B_t) = s_t[B_t(x_0, x_1)]$ for $t \in \{0,1\}$.

Differentiating equation (4.34) by two cash-flow components, namely x_{0i} in $t = 0$ and x_{1i} in $t = 1$, and afterwards modifying and combining these first-order conditions leads to:

$$s_0'(B_0) \cdot \left(1 + \frac{a}{\lambda_0}\right) \cdot \left(\frac{\partial B_0}{\partial x_{0i}} - \gamma_{P1} \cdot \frac{\partial B_0}{\partial x_{1i}}\right)$$

$$= s_1'(B_1) \cdot \left(1 + \frac{a}{\lambda_0} \cdot \frac{\gamma_{P1}}{\gamma_{A1}}\right) \cdot \left(\frac{\partial B_1}{\partial x_{1i}} - \frac{1}{\gamma_{P1}} \cdot \frac{\partial B_1}{\partial x_{0i}}\right) = 1 \tag{4.35}$$

with $\lambda_0 = \frac{U_0'}{V_0'}$ and $\gamma_{P1} \equiv \frac{U_0'}{U_1'}$, $\gamma_{A1} \equiv \frac{V_0'}{V_1'}$. γ_{P1} and γ_{A1} represent the time preferences of principal (P) and agent (A).[278]

Under the existence of cash-flow components that are completely and immediately recognized within the income statement the cash-flow components only influence the assessment basis of the period in which they are recognized. Thus, through the incorporation of (4.32) and (4.33), (4.35) can be expressed as:

$$s_0'(B_0) \cdot \left(1 + \frac{a}{\lambda_0}\right) = s_1'(B_1) \cdot \left(1 + \frac{a}{\lambda_0} \cdot \frac{\gamma_{P1}}{\gamma_{A1}}\right) = 1 \tag{4.36}$$

Under equal time preferences of principal and agent, i.e. $\gamma_{P1} = \gamma_{A1}$, (4.36) shows that the marginal compensation of both periods has to be the same, i.e. $s_0'(B_0) = s_1{}'(B_1)$.

[276] See Velthuis (2004a), p. 172; Pfeiffer/Velthuis (2009), p. 22.
[277] See Velthuis (2004a), p. 172; Pfeiffer/Velthuis (2009), p. 24.
[278] See Velthuis (2004a), p. 173; Pfeiffer/Velthuis (2009), p. 24; Ortner/Velthuis/Wollscheid (2016), p. 45.

In the case of an agent with higher time preferences than the principal, i.e. $\gamma_{A1} > \gamma_{P1}$, the marginal compensations will have to differ, i.e. $s_1'(B_1) > s_0'(B_0)$. This means that the marginal compensation of the agent will have to increase over time to compensate for his impatience.[279] This intuitively makes sense as an agent with higher time preferences will be more impatient than the principal, placing a bigger emphasis on the present. To compensate for this, a higher marginal compensation in period one is necessary to counterbalance the lower marginal utility the agent receives from his compensation in period one.

Additionally, it is assumed that there are also cash-flow components which influence not only the assessment basis in the period in which they are recognized. In the case of a combination of immediately recognized cash flows and others that influence the assessment basis of periods different from those in which they are recognized, introducing (4.36) into (4.35) shows:

$$\frac{\partial B_0}{\partial x_{0i}} + \frac{1}{\gamma_{P1}} \cdot \frac{\partial B_1}{\partial x_{0i}} = \gamma_{P1} \cdot \frac{\partial B_0}{\partial x_{1i}} + \frac{\partial B_1}{\partial x_{1i}} = 1 \tag{4.37}$$

Through equation (4.37) it becomes evident that the assessment basis has to be adjusted by the time preference rate of the principal so that the cash-flow components will influence the assessment basis in a net-present-value-neutral way.[280]

Equation (4.37) can also be expressed in a different way to show the *principle of net present value identity*:[281]

$$\sum_{\tau=0}^{1} \gamma_{P1}^{-\tau} \cdot \frac{\partial B_\tau}{\partial x_{ti}} \cdot dx_{ti} = \gamma_{P1}^{-t} \cdot dx_{ti} \tag{4.38}$$

Equation (4.38) shows that if an assessment basis for each point in time contains cash-flow components that are immediately recognized, all cash-flow components must only influence the assessment basis such that the present value of the changes of the assessment basis based on the time preference of the principal has to equal the present value of the cash flows.[282]

[279] See Gillenkirch/Schabel (2001), pp. 227-228; Velthuis (2004a), p. 174.
[280] See Velthuis (2004a), p. 176.
[281] See Velthuis (2004a), p. 176.
[282] See Velthuis (2004a), p. 176.

A modification of the common principle of net present value identity which is less restrictive concerning the characteristics of the compensation function and which does not depend on equal time preferences and risk-neutrality of both participants is formulated by Velthuis in the following way: If the assessment basis includes cash-flow components that are immediately and completely recognized for each time period and if the time-preference rate of the principal is constant, it is necessary for preference similarity that all cash flows enter the assessment basis in such a way that the present value of the assessment basis based on the time preference rate of the principal equals the present value of the cash flows but for a constant.[283]

Net present value identity and, thus, the requirement for a preference-similar assessment basis is only fulfilled for cash flow, residual income, and (restricted) share price.[284] The following section will, therefore, deal with some of these preference-similar performance indicators and it will additionally show why stock options are not a valid preference-similar performance indicator.

4.4 Preference-similar Performance Indicators

4.4.1 Residual Income

4.4.1.1 Residual Income Concepts

One possible preference-similar performance measure is the concept of residual income. Residual income is defined as the amount that remains when deducting a minimum interest demanded by the investors on the invested capital from the accounting income of the company.[285] Generally speaking, it is calculated by deducting a capital charge (c) on the invested capital at the beginning of the period (IC_{t-1}) from the accounting income (AI_t):[286]

$$R_t = AI_t - c \cdot IC_{t-1}$$

The capital charge resembles the costs of both equity and debt. By using costs not only on debt but also on equity, a manager will not be tempted to increase a company's leverage through debt financing.[287] The idea behind this concept is that a company has to provide more than the minimum rate of return if it wants to create value for the

[283] See Velthuis (2004a), p. 176; Laux (2006b), pp. 463-465.
[284] See Velthuis (2017), p. 66.
[285] See Wiedmann/Aders/Wagner (2001), p. 720.
[286] See Ewert/Wagenhofer (2014), p. 464.
[287] See Merchant/Van der Stede (2012), p. 427.

shareholders. Consequently, positive residual incomes will stem from value-creating investments while negative residual incomes will be seen as value-destroying.[288]

Residual income concepts that are used as an assessment basis in practice include, e.g., Economic Value Added (EVA) and Cash Value Added (CVA). The starting point of the EVA concept (similar to that of most residual income concepts) is the net income stemming from financial accounting. Net income itself cannot be used as a preference-similar performance indicator as it does not incorporate the cost of equity and is deemed to be oriented towards the past and characterized by short-termism.[289] Therefore, net income needs to be adjusted to allow for it to be used in compensation systems that can properly incentivize the manager. Consequently, residual income concepts incorporate the cost of equity. Additionally, they are designed to deal with the problems of short-termism and the orientation towards the past through adjustments. In the case of the EVA concept these adjustments are termed "conversions".[290] There are 164 possible conversions within the concept that can be categorized into four categories (operating conversions, funding conversions, shareholder conversions, and tax conversions).[291]

The incorporation of cost on equity in value-added concepts can either be done on all invested capital (entity concept) or on all own capital employed (equity concept).[292] Independent of the two different concepts for calculating a value-added performance indicator, what most concepts have in common is that they are calculated using risk-adjusted interest rates that represent the *ex-ante* anticipated return on capital from the investors and depend on the company's operative and financial risk.[293]
Using the entity concept, the value-added can be determined in the following way:[294]

$$xVA_t^{Entity} = EBIAT_t - k_{WACC} \cdot IC_{t-1}$$

$EBIAT$ contains the earnings before interest and after tax, k_{WACC} stands for the weighted average cost of capital, and IC_{t-1} is all the invested capital of a company at the beginning of period t. The weighted average cost of capital will be calculated by

[288] See Wiedmann/Aders/Wagner (2001), p. 720.
[289] See Velthuis (2004a), p. 178.
[290] See Velthuis (2004a), p. 178.
[291] See Merchant/Van der Stede (2012), p. 427.
[292] See Eidel (1999), p. 71; Wiedmann/Aders/Wagner (2001), p. 712; Velthuis/Wesner (2005), p. 29; Hönninger (2010), pp. 51-52.
[293] See Velthuis (2004a), p. 178; Velthuis/Wesner (2005), pp. 30, 35.
[294] See Wiedmann/Aders/Wagner (2001), pp. 724-725; Velthuis/Wesner (2005), p. 29.

weighing the capital costs on borrowed capital and the capital costs on equity.[295] While the capital costs on borrowed capital can easily be obtained, the capital costs on equity have to be estimated by, for example, using the capital asset pricing model (CAPM).[296] Meanwhile, using the equity concept, the value-added can be determined in the following way:[297]

$$xVA_t^{Equity} = EAT_t - k_{EC} \cdot E_{t-1}$$

Here, the value-added concept is calculated by deducting risk-adjusted capital costs of equity (k_{EC}) on the book value of equity (E_{t-1}) from the earnings after tax (EAT_t). As interest and, therefore, the capital costs of borrowed capital have already been deducted from the earnings in the EAT, only the capital costs on equity have to be deducted. The risk-adjusted capital costs on equity in this concept will, similar to the entity concept, be calculated using the CAPM.

Residual income concepts will, under the Preinreich-Lücke theorem, only fulfill the principle of NPV identity if (1) the profits fulfill sum identity, i.e. the clean-surplus condition[298], (2) the profits before interest are reduced by a capital charge on the invested capital at the beginning of the period, and (3) residual income is discounted by the same interest rate that was used in the calculation of the capital charge.[299] For common residual income concepts, some of these assumptions as well as other characteristics are problematic. These will be detailed in the next section.

4.4.1.2 Problems of Regular Residual Income Concepts

4.4.1.2.1 Risk-adjusted Interest Rate, Clean Surplus Condition, and Shape of the Compensation Function

For an assessment basis to be preference similar it has to fulfill the concept of net present value identity based on the risk-free interest rate.[300] As Velthuis has shown, the costs of capital must be calculated on a risk-free basis, namely the risk-free interest rate of the shareholders as long as the equity base does not remain constant.[301] Additionally, as stated in the previous section, the *clean surplus condition* needs to be

[295] See Wiedmann/Aders/Wagner (2001), p. 722.
[296] See Wiedmann/Aders/Wagner (2001), p. 719; Velthuis/Wesner (2005), p. 30.
[297] See Wiedmann/Aders/Wagner (2001), pp. 720-722; Velthuis/Wesner (2005), p. 29.
[298] For a definition of the clean surplus condition, see: Ewert/Wagenhofer (2000), pp. 10-12; Laux (2006a), pp. 92-95.
[299] See Lücke (1991), pp. 264-265; Velthuis (2004a), p. 180; Kesten (2005), p. 2; Hönninger (2010), pp. 24-26; Küpper (2013), pp. 325-326; Ewert/Wagenhofer (2014), pp. 59-60.
[300] See Velthuis (2003), p. 120.
[301] See Velthuis (2004a), pp. 180-181.

fulfilled and all performance components of the assessment basis have to be taken into account.[302]

Most residual-income concepts do not comply with these requirements. First of all, value-added concepts like EVA or CVA use a risk-adjusted capital charge on the invested capital. Using these risk-adjusted interest rates in calculating the residual income is appropriate for planning purposes but problematic when they are used for evaluating managerial performance. Risk-adjusted costs of capital basically represent a minimum return that is expected by the shareholders *ex ante* and serve as a hurdle value for the potential investment projects that the manager will decide on in the planning process.[303] These risk-adjusted weighted average costs of capital used within the residual income are not a certain figure but merely the expression of the expected return based on the development of the company's environment and the overall market.[304] Consequently, the manager's performance, which is evaluated *ex post*, is evaluated independently of the real development of the overall market or the specific market in which the company operates. However, the principle of comparability demands that the performance measure compares a manager's performance to that of the market at the same risk level. This is only possible when the real returns of the market are used and not the *ex-ante* expected ones.[305] Consequently, the assessment basis for a performance evaluation should only be calculated using risk-free costs of capital which mirror the risk-free character of the manager's performance within the *ex post* evaluation.[306]

However, there are further problems when using risk-adjusted cost of capital. Velthuis and Wesner argue that evaluating the performance of a manager *ex post* (meaning that it is already certain and, thus, risk-free) with an interest rate that is uncertain and can only be expected *ex ante* is highly problematic and will evoke the danger of underinvestment within the company.[307] For one, if investment projects a manager has chosen have a return which is lower than the risk-adjusted cost of capital this does not necessarily mean that these investments have destroyed value. Velthuis and Wesner argue that as long as its return is higher than the risk-free cost of capital of the shareholders,

[302] See Velthuis (2004a), pp. 180-182; Velthuis (2004c), p. 24; Küpper (2013), pp. 325-326; Ewert/Wagenhofer (2014), pp. 59-60.
[303] See Velthuis (2004b), p. 315; Velthuis/Wesner (2005), p. 30; Matschke/Brösel (2013), p. 522.
[304] See Velthuis (2004b), pp. 315-316; Velthuis/Wesner (2005), p. 30.
[305] See Velthuis (2004c), p. 20; Velthuis (2004b), p. 316.
[306] See Velthuis/Wesner (2005), p. 31.
[307] See Velthuis/Wesner (2005), pp. 31, 85-86.

the project will still add value. Thus, a manager may decide against an investment project which would be in the interests of the shareholders when he is evaluated based on the risk-adjusted cost of capital.[308]

Additionally, when making investment decisions, a risk-averse manager will already incorporate a risk premium into his calculations. The level of his subjective risk premium will depend on his compensation's degree of dependence on the performance measure.[309] If the capital charge which is used to calculate the residual income is determined through a risk-adjusted rate, the manager will add his risk premium (denoted by D) on top of the risk-adjusted rate, basically accounting for risk twice.[310] Instead of evaluating projects based on k, he will evaluate them with an interest rate of $k + D$. Therefore, certain projects that he decides not to invest in may be in the interest of the shareholders as their rate of return would be higher than the risk-free cost of capital and even the risk-adjusted cost of capital.[311] The problem of underinvestment runs contrary to the basic principle of preference similarity as it leads the manager towards decisions that may not always be in line with how the shareholder himself might decide.

The second problem innate to the usual value-added concept is the violation of the clean surplus condition. For the clean surplus condition to be fulfilled, the profit of period t (P_t) has to equal the sum of all cash flows and, thus, the changes in equity between the beginning and end of period t ($E_t - E_{t-1}$) plus the net outflows to the shareholders (NO_t):[312]

$$P_t = E_t - E_{t-1} + NO_t$$

According to this principle, all cash-flow components should be entirely incorporated into the assessment basis and should only be adjusted in a cash-flow-neutral way. As the value-added concepts make use of a vast range of adjustments, they tend to violate the clean surplus condition. For example, by adjusting a company's earnings through the removal of profits and losses that result from selling or shutting down an investment or a machine, the concepts can violate the clean surplus condition.[313] Furthermore, removing all non-company related elements like stocks may allow the manager

[308] See Velthuis/Wesner (2005), p. 31.
[309] See Laux (2001b), p. 3.
[310] See Velthuis/Wesner (2005), pp. 85-86.
[311] See Laux (2001b), p. 5.
[312] See Ewert/Wagenhofer (2014), p. 529.
[313] See Velthuis (2004a), p. 182.

to solely concentrate on the operative business but it also means that these components will not be incorporated into the manager's decision-making.[314]

The above-mentioned adjustments that the value-added concepts employ violate the condition of strict preference similarity as they require that the manager has to be evaluated on and has to participate in all cash-flow components independent of their source and whether or not he can influence them. The "win-win" condition of preference similarity not only has to hold for the operative area, it must also be independent of the area of performance components.[315] Only in the combined case of risk neutrality and the manager being unable to influence the cash flows is it permissible to disregard cash flow components.[316]

As selling or shutting down investments or machines is not incorporated into the performance components that are used for the evaluation and compensation of the manager, he may have the incentive to sell or shut down certain investments without any negative ramifications even though his decision may run counter to the interests of the shareholders. This is one of the possible outcomes violating the clean surplus condition through adjustments that run counter to the concept of preference similarity. Thus, ignoring all performance components that are not part of the operating business may, ultimately, lead to misincentives or behavior which runs counter to the shareholders wishes.[317]A remedy to these problems that come with the adjustments would be not to use them and instead devise a concept that regards all cash flow components within a company.

As can be seen by analyzing the problems that common value-added concepts have, preference similarity of residual income as an assessment basis can only be achieved by using a risk-free capital charge and incorporating all cash-flow components into the assessment basis, thus fulfilling the clean surplus condition. One residual income concept that fulfills these conditions is the so-called "Earnings less riskfree Interest Charge" concept (ERIC), which calculates the cost of capital based on a risk-free interest rate. Furthermore, it incorporates all elements that lead to changes in the net assets and only allows for adjustments that redistribute components over time, therefore, fulfilling the clean surplus condition.[318]

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[314] See Velthuis/Wesner (2005), p. 88.
[315] See Velthuis/Wesner (2005), pp. 87-88.
[316] See Velthuis (2004a), p. 182.
[317] See Velthuis (2004a), p. 182.
[318] For further information on ERIC, see Velthuis (2004c); Velthuis/Wesner (2005).

4.4.1.2.2 Participation in Gains and Losses

Preference similarity also requires the compensation function to be designed in such a way that the manager participates not only in gains but also losses. As the "win-win" principle states, the manager should not only share financial advantages with the shareholders but also financial disadvantages when the company experiences a loss. However, due to limitations of liability, most compensation functions are designed in such a way that the manager is not permitted to participate in losses through the introduction of floors.[319] This protection from losses can lead to several misincentives when choosing investment projects, just as it may lead to earnings management.[320] Due to the limitations of liability, it is necessary to find concepts that allow for the manager to participate in losses without him having to pay out of his own pocket. Two of these concepts are the bonus bank and averaging. These two methods not only limit the potential of misincentives from the absence of loss participation but also represent potential methods with which the principle of smoothing can be achieved.

There are several possibilities for how the *bonus bank* will operate. The most common type of bonus bank was developed with the intention of promoting long-term thinking, smoothing of bonus payments, and the retainment of employees.[321] It is designed in such a way that the bonus is not paid out to the manager immediately but rather is (partially or completely) transferred to a company-internal account where it will be netted against the current account balance which itself consists of the balance of the manager's bonuses from previous years.[322] A share of the account balance will then be paid out to the manager every year.[323]

Within a bonus bank, negative bonuses can also occur. These will reduce the account balance of the bonus bank and can even result in a negative account balance. In the case of a negative account balance, the manager will not receive any payout from his account until the account balance is positive again. Therefore, a bonus bank allows for certain participation in losses of the manager without disregarding the limitations of liability that exist. The manager will not have to pay out of his own pocket but his behavior, instead, the account balance of the bonus bank will be reduced and, therefore, lead to a financial disadvantage. Bad performances or myopic actions that have

[319] See Gillenkirch (1997), pp. 45, 50; Laux (2006a), pp. 277-278.
[320] See Laux (2006a), pp. 277-278.
[321] See Carey (1978), pp. 53-56.; Plaschke (2006), pp. 562-563.
[322] See Riegler (2000a), p. 163; Weber et al. (2017), p. 169.
[323] See Riegler (2000a), p. 163.

negative long-term consequences can, thus, be accounted for and the bonus bank will partially be able to fulfill the "win-win" condition, even under limitations of liability.[324]

However, a bonus bank also has several disadvantages. For one, it is shown by Schabel that a bonus bank is not preference similar if there is no interest paid on its account balance.[325] Furthermore, the principle of the bonus bank is rather complex and, consequently, does not abide by the principles of simplicity and comprehensibility.[326] Also, depending on the time preference of the manager, a bonus bank can be harmful as far as the timeliness of the reward for the manager's decisions is concerned.

The second method, *averaging*, is incorporated in the value-based concept ERIC and is postulated to be an alternative to a bonus bank that is characterized as being simpler and more effective. Contrary to the bonus bank, it also fulfills the principle of preference similarity.[327] Within this concept, the manager's bonus is based on the average residual income over a span of the last *n* years (Velthuis suggests three years[328]). It is easy to see that averaging allows for the smoothing of bonuses as it not only incorporates the residual income of the current year but also factors in those of the previous periods. Having the manager participate in the average residual incomes also allows the attribution of a financial disadvantage to the manager even in the presence of the limitations of liability.[329] Negative or low residual incomes will be incorporated into the calculation of the manager's bonuses for the next *n* years and will, therefore, reduce the payout that he can receive. Additionally, this way of setting a manager's bonus is much more easily understood than the rather complex method of calculating the bonuses paid out through a bonus bank, solving another problem of the bonus bank.

4.4.1.3 Summary of the Requirements for Using Residual Income as an Assessment Basis

As stated in Section 4.3.3, residual income is one of the possible assessment bases that can fulfill the principle of preference similarity. However, through the analysis of common residual income concepts in the previous two sections, it becomes evident that these have several weaknesses that prevent them from properly achieving preference similarity between shareholders and managers. For one, they use a risk-adjusted rate

[324] See Riegler (2000a), p. 163.
[325] See Schabel (2004), pp. 120-123.
[326] See Velthuis (2004a), p. 29.
[327] See Velthuis (2004c), p. 29.
[328] See Velthuis (2004c), p. 29.
[329] See Velthuis (2004c), pp. 29-30.

to calculate the capital charge in order to evaluate a manager's performance and compensate him. Additionally, through the adjustments within the concepts that remove all non-operative performance components, the clean surplus condition is also violated. Moreover, the payout structure of bonuses through a bonus bank that does not yield interest on the bonus bank's account balance also violates the requirements of preference similarity.

In order to properly use residual income as a preference-similar performance indicator, it is imperative to make use of a risk-free capital charge and only allow adjustments that redistribute performance components over time and abstain from those that exclude elements that are not part of the operative business but which can still lead to changes in net assets. Furthermore, to make sure the manager not only participates in gains but also in losses, instead of using a bonus bank his annual bonus should be calculated based on the average of residual incomes over the last *n* years. This averaging not only fulfills the requirements of preference similarity but is also much simpler and, therefore, more easily understood than a bonus bank. One residual income concept that fulfills these requirements and, therefore, is preference similar is the so-called ERIC concept by Velthuis.[330] Using it will lead the manager to act in the interests of the shareholders as the "win-win" condition holds.

4.4.2 Stock Price

4.4.2.1 The Basics of Stocks as an Assessment Basis

Another possibility of a preference-similar assessment basis is the use of a company's share price. Listed companies are continuously evaluated by the market based on expectations for the company's future performance. The share price, therefore, resembles the market value of a company.[331] The market value of a company, which is determined by the capital markets if it is publicly traded is seen as the closest measure for a company's true intrinsic value.[332] Shareholders not only profit from dividend payments but also receive financial benefits through the sustainable increase of a company's share price.[333] Employing the share price as an assessment basis gives the manager an incentive to increase it and, consequently, improve the market value of the company. Thus, the use of the share price in the compensation system helps to align

[330] For further information on the ERIC concept, see Velthuis (2004c).
[331] See Küpper (2013), p. 337; Steiner/Landes (2017), p. 225.
[332] See Merchant/Van der Stede (2012), p. 415.
[333] See Steiner/Landes (2017), p. 225.

the manager's decisions with the interests of the shareholders.[334] Using market measures also has several other appeals, namely their availability on a daily basis, their precision and accuracy, and their objectivity. Furthermore, they are said to be understandable as concerns what they represent and are also cost effective as the company need not employ any expenses to measure it.[335]

Using the share price as an assessment basis also fulfills the "win-win" condition: If the manager's compensation is dependent on the improvement of a company's share price, not only he but also the shareholders will profit when the share price is used as an assessment basis.[336] If he, however, undertakes decisions that are not in the interests of the shareholders, this will also be negatively evaluated by the market, leading to a drop in the share price. Therefore, the manager will have a financial disadvantage when the shareholders have a financial disadvantage.

However, it is imperative that incentivized employees whose compensation depends on the company's share price are able to influence it. This is one of the basic requirements of the compensation system. As a consequence, using the share price as an assessment basis is only recommended for high-level managers and the top management team.[337] Even those actors within a company cannot totally control market measures as they are also dependent on macroeconomic activities, the political climate, industry events, and the general stock market movements.[338] Also, market measures may not always reflect the realized performance as they are highly influenced by future expectations. Here, the share price can also move due to overreactions to news, for example. Moreover, as companies, for competitive reasons, tend to treat certain information like layoff intentions, pricing, or research and development productivity as confidential, the market is not privy to this information.[339]

Usually, employing the share price as an assessment basis is put into practice either through shares or stock options. There are also so-called virtual instruments such as phantom stocks or stock appreciation rights. These will not form part of the present study, however.[340]

Often the use of shares is achieved through restricted stock awards that grant shares in

[334] See Hall/Murphy (2002), p. 4; Weber et al. (2017), p. 170.
[335] See Merchant/Van der Stede (2012), p. 415.
[336] See Weber (2017), p. 171.
[337] See Merchant/Van der Stede (2012), p. 415; Janocha (2014), p. 25; Weber et al. (2017), p. 170.
[338] See Merchant/Van der Stede (2012), p. 415.
[339] See Merchant/Van der Stede (2012), p. 416.
[340] See Janocha (2014), p. 26.

the company to the manager. As part of his compensation, he will have the right to purchase shares at a price that is below the current share price.[341] These shares usually have a vesting period preventing the manager from selling them too soon. After the vesting period, the manager can then freely decide on what to do with the stock.[342] Stock options have a different profile to restricted stock and possess a different incentive structure. As these are often subject to controversy, they will be presented in further detail in the next section.

4.4.2.2 Definition and Characteristics of Stock Options

Just like restricted stock, stock options should incentivize the manager to raise the share price of the company and thereby increase its market value. Consequently, the manager is said to act in the interest of the shareholders when receiving stock options.[343] Similar to the objectives that most residual income concepts claim for themselves, stock options are often employed with the intention of motivating the recipient and also improving the retainment of employees.

Additionally, it is argued that stock options also help to attract talented managers from outside the company as they are often said to be an essential requirement of the compensation in international competition.[344] Furthermore, including stock options in compensation plans raises the possibility that a company will attract managers that are not only higher-skilled but also less risk-averse and prefer to be compensated with elements that provide higher performance-based upside potential. Therefore, including stock options in compensation plans is said to reduce the problem of adverse selection in the application process.[345]

However, utilizing stock options could also attract managers that tend too overtly towards risk taking and may only focus on raising the share price in the short term, thus this argument needs to be evaluated with caution.

An additional benefit, as some authors argue, is the leverage effect of stock options. Due to their lower value compared to restricted stock, a manager can receive a higher amount of stock options than restricted stock, which allows for stronger incentives than would be the case with restricted stock.[346]

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[341] See Janocha (2014), p. 26.
[342] See Kolb (2012), p. 53.
[343] See Winter (2001), p. 522; Achleitner/Wichels (2002), p. 11.
[344] See Achleitner/Wichels (2002), p. 12.
[345] See Hall/Murphy (2002), p. 4.
[346] See Pertl/Nenning/Pichler (2002), p. 358.

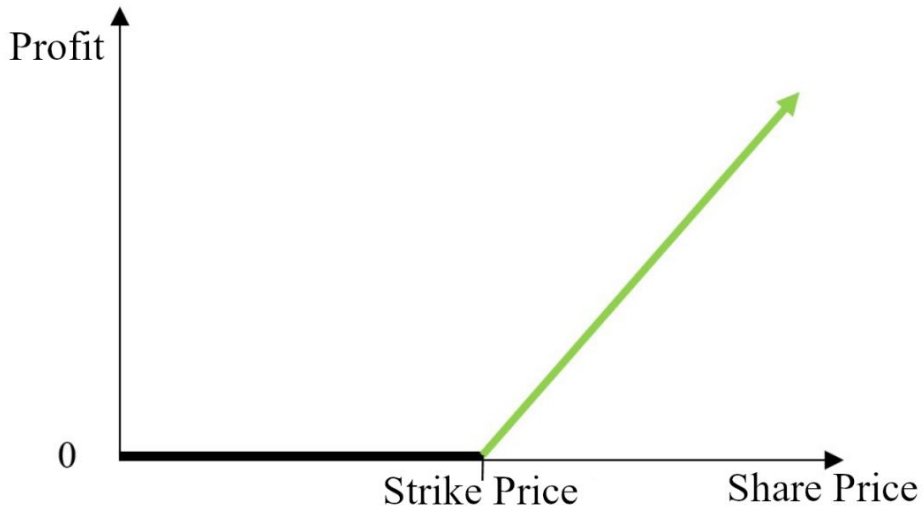

Figure 2: Characteristics of a Call Option[347]

A stock option gives the holder the right to either buy a number of shares (call option) or sell them (put option) at a predetermined price.[348] Stock options have an expiry date which means that the holder of the option cannot keep it indefinitely. Either he has the right to buy/sell a number of shares up until the expiration date of the stock option (American option), or at the expiration date (European option).[349] The holder is, however, not obligated to exercise an option and can also let it expire.

Within the realm of management compensation, there are two different types of stock options that are employed: real and virtual stock options.[350]

Real stock options that are used within compensation systems are all different versions of call options[351] (see *Figure 2*) which grant the incentivized employee the right to purchase a defined number of shares from his company during a defined time frame.[352] This time frame is restricted by a vesting period at the beginning which defines the earliest possible exercise date (usually three to five years[353]) and the expiration date which usually is ten years after the grant of the option.[354] As their characteristics lie somewhere in between European and American options they are sometimes classified as Bermudan options.

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347 Own Depiction based on Hull (2015), p. 34.
348 See Janocha (2014), p. 26.
349 See Kolb (2012), pp. 56-57; Janocha (2014), p. 26.
350 See Weißenberger/Weber (1999), p. 673.
351 See Devers/Wiseman/Holmes (2007), pp. 193-194; Kolb (2012), p. 56.
352 See Devers et al. (2008), p. 550.
353 See Hall (2000), p. 122; Merchant/Van der Stede (2012), p. 373.
354 See Spalt (2008), p. 8; Merchant/Van der Stede (2012), p. 373.

Like American options, they can be exercised before the expiration date but in contrast to them, this is only possible after the vesting period has concluded.[355] The base price of a stock option used within a compensation system is most often equal to the company's current share price, i.e. the option is *"at the money"* and termed a "fair market value option". Sometimes, however, stock options are also given out at a strike price which is, in the case of a so-called "discount option", below or, for a "premium option", above the current share price of the company.[356] When the share price of the company is above the strike price of the option, the stock option is said to be *"in the money"* while it is *"underwater"* when the current share price is below the strike price.[357]

Another possibility through which a manager can participate in stock options is the use of stock-option plans which make use of virtual/non-marketable stock options. Here, just as with regular stock options, the options are given a specific base price (often the current share price of the company) and a time period during which the manager is allowed to exercise these non-marketable options (usually ten years). Stock option plans also have a vesting period during which the manager is not allowed to exercise his options. Instead of then purchasing company shares for the predefined price, the manager will be rewarded with the monetary difference between the stock options base price and the current share price of the company.[358] Usually, stock-option plans will restrict the manager in the number of stock options that he can exercise at once as the plans also contain a predefined distribution of the maximum number of options the manager can sell.[359]

Using stock options in management compensation also has consequences for the shape of the compensation function which is determined by the nature of call options: On the one hand, stock option compensation possesses a floor as the incentivized manager cannot lose anything if the current share price is below the exercise price of an option. On the other, there is no cap as theoretically the share price could rise indefinitely and, therefore, the compensation based on stock options would do the same. A limitation, however, is given by the predefined amount of stock options the manager receives and the quantity restrictions regarding the execution of options. This, of course, limits the

355 See Kolb (2012), pp. 56-57.
356 See Deyá-Tortella et al. (2005), pp. 110-111.
357 See Devers/Wiseman/Holmes (2007), pp. 193-194; Merchant/Van der Stede (2012), pp. 373-374.
358 See Devers/Wiseman/Holmes (2007), pp. 193-194.
359 See Imberger (2003), p. 188; Imberger/Locarek-Junge (2006), p. 549; Steiner/Landes (2017), p. 229.

maximal amount of money a manager can make at once through raising the share price.[360]

Due to the characteristics of stock options described in the previous paragraphs, they are said to process different characteristics and have different incentivizing effects compared to restricted stock.[361] Compared to restricted stock which often has to be bought by the manager and, therefore, possesses the potential for downside risk when the share price falls below the initial purchasing price, stock options that are underwater do not have to be exercised and will simply expire. Thus, many authors argue that stock options offer unlimited upside potential without any downside risk as they allow the manager to participate in the company's gains while insulating him from threats to his own wealth.[362]

The authors also argue that this asymmetric risk profile will lead managers to take greater risks as the options themselves are costless to them. Agency theorists, subsequently, ascribe stock options three characteristics that will align the interests of managers and shareholders by incentivizing them to pursue wealth-maximizing strategies.[363]

First, they argue that stock options reduce the likelihood of shirking compared to the use of restricted stock. Second, to allow for greater attainment, almost all stock options within compensation systems can only be executed by the manager as long as he stays in the company. Once a manager wants to leave a company, he has to exercise his vested stock options that are in the money and will, consequently, receive the benefits of all the options. If the manager leaves the company and options have not yet vested or are out of the money, usually these must be forfeited.[364] Thus, managers with a large portfolio of unvested options will have reduced incentives to leave a company prematurely. Also, due to the forfeit of not yet vested options, managers cannot simply push up the share price of a company and reap the rewards of freshly received stock options before leaving a company.

In theory, stock options should, therefore, promote the long-term thinking, behavior, and retainment of managers. Thus, proponents claim that through the installation of a vesting period and the restriction regarding the exercisable amount of stock options

360 See Pertl/Nenning/Pichler (2002), p. 358.
361 See Sanders (2001), pp. 478-479.
362 See Sanders (2001), p. 479; Devers et al. (2008), p. 551.
363 See Sanders (2001), p. 479; Deyá-Tortella et al. (2005), p. 110; Devers et al. (2008), p. 551.
364 See Kolb (2012), p. 57.

this can be achieved. Finally, through the limitation of downside risk, stock options would encourage managers to take greater risks.[365]

However, one of the advantages that agency theorists ascribe to stock options, namely the insulation from downside risk, leads to stock options only partially fulfilling the "win-win" condition of preference similarity. Managers who are rewarded with stock options only have a financial advantage when shareholders do. However, through the floor which is innate to call options, they are insulated from financial disadvantages that shareholders may have to bear, such as in the case of bad decisions.

Due to the stock options only partly fulfilling preference similarity, managerial behavior observed in practice has shown them to have a number of weaknesses. These will be discussed in the next section.

4.4.2.3 Problems with Stock and Stock Options as a Compensation Element

As mentioned in the previous section, due to the characteristics of a call option a manager is insulated from the downside risk his actions can potentially cause. The asymmetry participation in financial gains and losses violates the "win-win" condition that is required in order to achieve preference similarity. The insulation from downside risk has several problems that under certain circumstances lead the manager to pursue strategies that are harmful to the interests of the shareholders.

For example, when a company's share price is considerably below an option's strike price and said option is out of the vesting period, a manager may attempt to pursue strategies that will increase the share price regardless of their long-term consequences for the shareholders. Otherwise, his option will expire worthlessly, which is definitely not in his interest. He can achieve this by increasing the volatility of the company's shares through the selection of extremely risky investment projects.[366] Due to the asymmetric risk profile of stock options the manager will not bear the financial disadvantage the shareholders do even if his actions lead to a further drop in the company's share price.

Another problem may occur when the manager holds a large number of unvested stock options that are in the money. Here, it is argued that the manager will want to safeguard these options by steering the company in a rather conservative and less risky manner. This is due to the fact that risky projects might fail and reduce the company's share

[365] See Jensen/Meckling (1976), p. 353; Wowak/Hambrick (2010), p. 812.

[366] See Imberger (2003), p. 188; Imberger/Locarek-Junge (2006), p. 549; Kolb (2012), pp. 109-110; Steiner/Landes (2017), p. 229.

price, thus, endangering the option value.[367] Once the options are vested and exercised by the manager, he will change his risk profile again as there is no more threat to his perceived wealth.

This erratic behavior, namely being too risk-seeking in the case of underwater options and too risk-averse when holding a large amount of unvested in-the-money options, is not in the interest of the shareholders and can cause them to suffer financial disadvantages. The profile of vanilla call options, therefore, endangers shareholder wealth and is not preference similar.

A further problem of traditional stock options is the fact that, as pointed out in the previous section, they are usually awarded to a manager with a base price that is at the money. This, according to Bebchuk and Fried, leads the manager to mistakenly perceive the cost of equity to be zero. As share prices tend to historically appreciate over time, at the money options will usually earn the manager a profit even if his performance has destroyed value. The manager would basically be rewarded for market movements that he cannot control.[368]

A good example to illustrate this problem is given by Jensen, Murphy, and Wruck in their extensive paper about executive remuneration:[369] Consider a company that currently has a share price of \$57. The management now wants to employ a strategy that would increase the share price to \$100 in five years. Board and management have agreed on the cost of equity of the company to be 15% while paying an annual dividend of 2.5%. Consequently, a strategy that would yield the cost of equity would raise the share price to $\$57 \cdot 1.125^5 = \$102.72$. Thus, if the management pursued its proposed strategy, shareholders would lose \$2.72 per share in five years.

Additionally, the announcement of the strategy by the management and the belief of the market that their plan would increase the share price to \$100 in five years would lead to a correction of the current share price to $\frac{\$100}{1.125^5} = \$55.49$, which would result in a direct loss of \$1.51 per share for the shareholders. Meanwhile, the management that destroyed value with their strategy would in five years exercise their stock options and receive $\$100 - \$57 = \$43$ per share. Thus, they would be rewarded for destroying value and giving the shareholders a financial disadvantage.

A similar misalignment and violation of the "win-win" condition can occur when stock options are given out "at the market" (assume \$50) and the overall market rises by,

[367] See Kolb (2012), pp. 109-110.
[368] See Bebchuk/Fried (2004), p. 139.
[369] See Jensen/Murphy/Wruck (2004), pp. 60-61.

e.g., 25%. If the management's strategy were to lead to a new share price of \$60 (a return of 20%), their option value would then be \$10. However, simply investing in the market would give the shareholder a higher return ($\$50 \cdot 1.25 - \$60 = \$2.5$).

All of these examples clearly show that stock options should not be used as a compensation element if one wants to properly align the financial interests of shareholders and managers. However, also regular stock has a caveat when using it as a compensation element for every period: Namely, cash flows that are far in the future will be compensated until their realization in every period.[370] Thus, for a per-period compensation, the residual share price has to be used. This residual share price change (SPC) is calculated the following way: $SPC_t = SPCcum_t - (1+i)SPCex_{t-1}$ with $SPcum$ being the pre-payout share price and $SPex$ being the post-payout one. Using this method, the manager will part-take in the NPV of the respective projects he chose.[371] One possibility to account for market movements that are beyond the control of the manager when using stock would be to index the residual share price on the overall market or the performance of competitors. This would make it possible to filter out windfall profits from simple market movements and would force the manager to pursue value-enhancing strategies if he wants to achieve the targets set for him in his compensation plan.

Normal stock can still be used within a preference-similar compensation system. For one, it can be utilized as a long-term component within the compensation plan either as the assessment basis or by using stock with long-term vesting periods as part of the compensation package.[372] For another, giving the manager the opportunity to acquire shares of the company in share-matching plans can further help to bind him to the interests of the shareholders as he himself then has "skin in the game" as he becomes a shareholder.[373]

4.5 Recommendations for the Design of Management Compensation Systems

Chapter 4, so far, has analyzed how compensation systems should be designed for managers. This section now summarizes these results and provides a comprehensive overview of the design recommendations based on preference similarity.

[370] Velthuis (2019), p. 173.
[371] Velthuis (2019), p. 172.
[372] Velthuis (2019), p. 173.
[373] Velthuis (2019), p. 185.

The most important point when designing a compensation system is to make sure that it is *simple, comprehensible,* and *transparent*. These requirements were discussed in Section 3.5.2 and are especially important when putting the compensation system into practice. A compensation system that is not easily understood will not have a big effect on the manager as he may not comprehend the link between his performance and his pay. Furthermore, transparency allows for higher acceptance of a compensation system, which will further increase its effectiveness.
Another basic requirement is *flexibility* which was also discussed in Section 3.5.2. The flexibility of a compensation system allows the company to react to changes in its environment and especially changes in the overall economic situation. Flexibility allows the compensation system to adjust to these changes so that it can still incentivize the manager under changed circumstances.

Next off, it is imperative that compensation systems are designed in a *preference similar* way. Section 4.3.1 explained why preference similarity is a better base for a compensation system in the managerial space than classical agency theory. Contrary to classical agency theory, preference similarity is more useful for more flexible jobs with a wide range of varying tasks—exactly what is demanded of a manager.
When incorporating preference similarity into a compensation system, it has to be designed in such a way that the manager will only have a financial advantage (disadvantage) when the shareholders do. This *"win-win" condition* is necessary to properly incentivize the manager to act in the interest of the shareholders.
When designing a preference-similar compensation system, both the *assessment basis* as well as the *compensation function* of the variable compensation have to be preference similar, as was made clear in Section 4.3.

The selection of the *assessment basis* for a preference-similar compensation system is, as shown in Section 4.3.3, based on its fulfillment of the *net present value identity*, which is the minimum requirement for preference similarity. This only allows for absolute performance measures to be used as an assessment basis. *Cash flow, residual income,* or the *share price* are recommended as an assessment basis for a preference-similar compensation system.
However, it is not a case of simply using any of the *residual income concepts* that exist. As was pointed out in Section 4.4.1.2.1, a preference-similar residual income concept should calculate its capital charge based on a *risk-free interest rate* and should only allow for adjustments that allow it to still fulfill the *clean surplus condition*. One

recommended residual income concept that fulfills both requirements is the *"Earnings less riskfree Interest Charge" (ERIC)* developed by Velthuis.

In the realm of the share price, *stock options* should not be used as a performance measure as they can never be preference similar. Instead, for a per-period performance measure the *residual share price* is recommend which, to filter out market movements, *should be indexed against the market or a basket of competitors*. Furthermore, *using stock as a long-term compensation component is recommend*. However, this *requires a vesting period* and *unwinding constraints*.

Another recommendation concerning the assessment basis that is also voiced by Velthuis[374] is the use of *several types of assessment bases*. This allows for the coverage of a larger number of tasks the manager has to execute and will, therefore, properly incentivize him in a larger area of his decision-making than would a single assessment basis. Velthuis points out that the *combination of residual income and share price* is especially fruitful. The former has a stronger focus on the past while the latter is more future-oriented.[375]

Furthermore, due to the fact that market measures like the share price also depend highly on elements that the incentivized manager cannot control, combining accounting measures like residual income with market measures like the share price will at least partially shield a manager and his compensation from market risks beyond his control.[376]

The *compensation function*, presented in Section 3.5, should be designed *in as linear a manner as possible* to minimize the conflict between preference similarity and Pareto-efficiency as shown in Section 4.3.1. Furthermore, the *use of caps and floors in the compensation function should at best be avoided*, especially when designing a strictly preference-similar compensation function. Both caps and floors can lead to misincentives.

For one, a cap gives the manager no further incentive to improve his performance once he has reached it. He may even shift some profits into the next period. For another, a manager whose performance is below the floor and who is unlikely to surpass it in the current period may further reduce his performance or utilize highly risky projects that have a very low likelihood of a positive payout. Here, he may also shift profits into the next period as once he is below the cap he will not have to fear any losses. Overall, the

374 See Velthuis (2017), p. 68.
375 See Velthuis (2017), p. 68.
376 See Merchant/Van der Stede (2012), p. 415.

manager may utilize so-called earnings management which is to the disadvantage of the shareholders.

As floors in the compensation function cannot be eliminated due to limitations of liability, Velthuis also suggests implementing a cap to prevent an asymmetry of risk in the compensation function. However, he advocates the *use of a wide incentive zone* so that the compensation to incentivize the manager can still be allowed for.[377]

Possible ways of having the manager participate in losses despite the limitations of liability were presented in Section 4.4.1.2.2. Through the use of a *bonus bank* or by compensating the manager based on a *multi-year average* of the assessment basis, the manager will suffer financial disadvantages when his actions are also disadvantageous to the shareholders. Therefore, these two methods also allow for the *smoothing* of his compensation, another basic requirement of compensation systems. Section 4.4.1.2.2 also showed that a multi-year average is preferable to a bonus bank as it is simpler and hence easier to understand—thus fulfilling two of the basic requirements. As averaging uses performance measures over a multi-year period, it can also help to counterbalance short-term actions that would be harmful to the shareholders in the long term.

Finally, the introduction of a *claw back clause* may reduce incentives for manipulation as discussed in Section 3.5.2. However, the use of claw backs has to be considered carefully. For one, it does not deter the manager from short-term actions that are harmful to the shareholders but not fraudulent.[378] For another, the implementation of a claw back clause can be difficult and may also reduce the acceptance of a compensation contract.

4.6 Empirical Studies of the Effectiveness of Management Compensation

4.6.1 Introduction

After having set the recommendations for the design of compensation systems for managers and executives in the previous section, it is now possible to turn to the analysis of how performance-oriented pay fares in practice. This is useful to see how managers respond to these types of payment systems and whether or not they can achieve what they are designed for.

Several aspects require analysis before it is possible to arrive at a conclusion and there is a multitude of empirical papers that address with these aspects. Most of the studies

[377] See Velthuis (2017), p. 68.
[378] See Edmans/Gabaix/Jenter (2017), p. 98.

deal with the effects regarding CEOs and do not focus on all different levels of managers. However, this focus does not imply that the results are not of any use for this work. If incentive payment were to have little to no effect on CEOs, this would indicate that incentive compensation as a whole should be reconsidered or should incorporate other elements. CEOs and their tasks are different from those of other executives or lower-tier managers. Yet if incentive payment cannot align the interests of CEOs and shareholders, there is reason to believe that it this would also be the case for other managers.

The sections that follow deal with the influence of pay on performance and the influence of pay on executive actions.

4.6.2 Pay on Performance

The first and perhaps most significant question that needs answering is how well incentive pay affects a manager's performance. The empirical evidence surrounding this question is mixed.

Using a total of 10,400 CEO years of compensation and performance data, a well-known study by Jensen and Murphy concluded that pay-for-performance sensitivity was "[…] small for an occupation in which incentive pay is expected to play an important role."[379] This was due to the fact that the authors only found a pay-for-performance sensitivity of $3.25 per $1,000 change in shareholder wealth.[380] Tosi, Werner, Katz, and Gomez-Mejia corroborated these findings through their meta-analysis of 137 empirical studies. According to them, changes in firm performance were only able to explain four percent of the variance in CEO pay.[381]

These findings seem underwhelming but there are also empirical studies that have criticized them. For example, in an empirical study of a model that analyzed pay-for-performance sensitivity across different risk settings, Garen argued that pay-for-performance sensitivity varies inversely with firm risk. According to him, in situations where the pay-for-performance sensitivity was high, managers would be more risk-averse as large parts of their payment were tied to firm performance. This, he postulates, was one of the reasons why Jensen Murphy only measured low sensitivities.[382]

Other authors like Leonard, who examined 439 large U.S. corporations over a period

[379] Jensen/Murphy (1990), p. 227.
[380] See Jensen/Murphy (1990).
[381] See Tosi et al. (2000).
[382] See Garen (1994).

of four years, found that long-term incentive plans resulted in significant increases in return on equity. He concluded that incentive payment had a positive effect on a manager's performance and stated that long-term incentive plans were in the interest of the shareholders.[383] In a similar mold, Gong's findings back the connection between pay and performance. He calls the idea of "[…] CEOs earning their pay while creating value for shareholders […] a pervasive phenomenon."[384] His results demonstrate high levels of association between pay for performance sensitivity and CEO pay efficiency.[385]

Others scholars took a more specialized look at certain elements of the compensation system. One of these is Wallace, who analyzed the effects of the adoption of residual income into compensation systems. In his comparison of companies that use residual income-based performance measures and those that relied on accounting-based ones, he found that the adoption of residual-income plans leads to increases in residual income. However, his study also showed that these increases did not result in shareholder wealth increases.[386] Wallace, consequently, concluded that "[…] 'you get what you measure and reward'."[387] Another author to study residual-income plans was Balachandran, who, similar to Wallace, finds that the adoption of these plans especially leads to increases in residual income and likewise concludes that "[…] you get what you pay for […]."[388] Interestingly, in their study, Hogan and Lewis found that anticipated adopters of an "economic profit plan" had a more efficient asset management, boosted higher levels of profitability, and were able to create more shareholder value than those companies who did not adopt such a plan. However, the findings also showed that economic profit plans as a whole did not have any significant effects on shareholder value.[389]

The effect of stock options on performance was analyzed by Hanlon, Rajgopal, and Shevlin, who found that stock option grants could positively influence firm performance. They showed that a $1 option grant (calculated via Black Scholes) would allow for $3.71 of undiscounted operating income growth in the following five years, making a strong case for pay-for-performance efficiency. However, according to their

[383] See Leonard (1990).
[384] Gong (2011), p. 26.
[385] See Gong (2011).
[386] See Wallace (1998).
[387] Wallace (1998), p. 275.
[388] Balachandran (2006), p. 392.
[389] See Hogan/Lewis (2005).

findings, it is not sufficient to simply offer managers a random amount of stock options. This is because the findings also showed that the effects of stock options on firm performance are not linear but rather concave, resulting in an optimal level of stock option pay that would maximize the relationship between options and firm performance.[390]

This has been corroborated by a number of other studies that analyzed the effect of equity-based incentives on firm value and found that the correlation between stock options and firm performance usually only holds at low levels of ownership and turns negative at high ones.[391] Some of these studies argue that this phenomenon is due to the fact that high levels of ownership by the manager will lead him to become entrenched and, for not wanting to reduce the value of his stock, will once again lead to increased agency problems.[392] Contrary to the findings mentioned so far in this paragraph, Dalton, Daily, Certo, and Roengpitya found no support for the relationship between stock ownership of a manager and firm performance in their meta-analysis of 229 empirical studies.[393] These differing findings may be explained by Wowack and Hambrick, who in their study concluded that stock options were able to improve the performance of talented executives while simultaneously doing the opposite for those with only low ability. [394]

To sum up, there is inconclusive evidence concerning the effect of incentive payment on firm performance. While some authors have indeed found positive effects, in particular the meta-study by Tosi, Werner, Katz, and Gomez-Mejia makes a compelling case against its effectiveness.

4.6.3 Pay on Executive Actions

Other than the question of whether incentive pay influences firm performance, it is also important to investigate whether incentive payment does in fact change a manager's actions and, if so, how.

Here, many studies paint a gloomy picture. Guidry, Leone, and Rock were able to show that incentive pay induced managers to act myopically. Based on their findings, managers maximized their short-term bonuses at the expense of long-term value

390 See Hanlon/Rajgopal/Shevlin (2003).
391 See McConnell/Servaes (1990); Mehran (1995); Agrawal/Knoeber (1996); Himmelberg/Hubbard/Palia (1999); Habib/Ljungqvist (2005); Kim/Lu (2011).
392 See Morck/Shleifer/Vishny (1988), pp. 294-295; Kim/Lu (2011), pp. 273-274.
393 See Dalton et al. (2003).
394 See Wowak/Hambrick (2010).

creation which would have been beneficial to shareholders.[395] Furthermore, Bergstresser and Philippon found that incentive pay leads to higher levels of earnings manipulation.[396]

Other authors specifically looked at the effects that equity-based pay would have on managerial behavior. Agrawal and Mandelker, looking at 153 companies acquired during 1974 and 1982, came to the conclusion that holdings of stock and stock options were able to reduce agency problems and, thus, advocated the use of equity-based incentives.[397] Contrary to these findings, however, several empirical studies have identified a positive correlation between the holdings of stocks or stock options and earnings manipulation.[398] For example, Coles, Hertzel, and Kalpathy found that executives would try to reduce the stock price as much as possible by managing earnings when they were about to be issued stock options from their compensation plan .[399]
Aboody and Kasznik, Chauvin and Shenoy, and Daines, McQueen, and Schonlau seconded these findings encountering abnormal negative returns and the release of negative news around the grant date of options, and afterwards an increase of positive news once the options were rewarded.[400] This would allow managers to profit from a lower exercise price and, thus, a higher likelihood of the stock options being in the money once they were vested.
The plan to sell off options was also shown to lead to artificially inflated stock prices by Bergstresser and Philippon.[401] This was corroborated by Edmans, Goncalves-Pinto, Groen-Xu, and Wang, who, in their survey of empirical literature on the topic, showed that CEOs tended to cluster the release of news regarding a company around times that equity incentives were about to vest.[402] The combination of artificially low stock prices during the issuing of stock options and the artificially inflated ones after the vesting of the options shows that incentive pay through stocks or stock options has unintended consequences that run counter to the interests of the shareholders.

Further evidence of the negative influence stock-based compensation on executive action is provided by Sanders and Carpenter, who analyzed the dividend policy of

395 See Guidry/Leone/Rock (1999).
396 See Bergstresser/Philippon (2006).
397 See Agrawal/Mandelker (1987).
398 See Cheng/Warfield (2005); Burns/Kedia (2006); Efendi/Srivastava/Swanson (2007); Peng/Röell (2008); Johnson/Ryan/Tian (2009).
399 See Coles/Hertzel/Kalpathy (2006).
400 See Aboody/Kasznik (2000); Chauvin/Shenoy (2001); Daines/McQueen/Schonlau (2018).
401 See Bergstresser/Philippon (2006).
402 See Edmans et al. (2018).

companies whose executives were rewarded with stock options. They found stock-repurchase programs (they increase the share price but are often not in the interest of the shareholders) to be specifically pronounced under high levels of information asymmetry between executives and board. Additionally, it appeared that the higher the level of stock options held by the CEO, the higher the likelihood of a stock-repurchasing program. Most interestingly, the authors found that the announcements of such repurchasing programs were especially prevalent when performance targets of managers were missed prior to the announcement.[403]

Matching the findings so far, Sanders and Hambrick found evidence for extreme corporate performances when stock options were used as part of the compensation plan. They especially pointed out that CEOs with high levels of stock options are more likely to provide shareholders with big losses than big gains. [404] Consequently, they stated that these findings "[…] suggest[ed] that stock options prompt CEOs to make high-variance bets, not simply larger bets."[405]

Furthermore, Kolev, Wiseman, and Gomez-Mejia found that CEOs with greater amounts of power were able to decouple their equity-based returns from those of shareholders. They concluded that "[…] CEOs have captured an increasing share of firm residuals relative to shareholders while simultaneously insulating their firm-specific wealth from fluctuations in firm value."[406]

All these findings call into question the use of equity-based incentives in management compensation. However, not only these types of incentives are a source of manipulation. Indeed, several authors have demonstrated that earnings-based bonus plans lead to earnings manipulation as well.[407] Due to the existence of caps and floors in the compensation functions of residual-income-based compensation elements, it was already expressed in Section 4.4.1.2.2 that these can lead to earnings management. Bennett, Bettis, Gopalan, and Milbourn, for instance, found significant clustering of performance slightly above the target or the threshold of the compensation function. For one, managers were incentivized to take actions that allow them to meet their performance targets but were potentially harmful.[408] For another, these findings also show that managers attempt to manage earnings once they reach the cap to prevent their

[403] See Sanders/Carpenter (2003).
[404] See Sanders/Hambrick (2007).
[405] Sanders/Hambrick (2007), p. 1055.
[406] Kolev/Wiseman/Gomez-Mejia (2017), p. 629.
[407] See Healy (1985); Holthausen/Larcker/Sloan (1995).
[408] See Bennett et al. (2017).

additional performance from going unrewarded and to avoid the ratcheting-up of future targets.

Overall, to follow Dalton, Dalton, Hitt, and Certo,[409] it would be possible to conclude that the concepts of aligning the interests of managers and shareholders through incentive payment does not properly work. However, in saying this, it is important to keep in mind that, on a basic level, every compensation system that relies on incentive payment has side effects. This of course begs the question of whether incentive payment is helpful at all, and whether it leads managers to perform better and more in the interests of shareholders than would be the case with a contract that contained no such incentives. Employing different measures to reduce agency problems may lead to further, and indeed different, problems but it can be argued that their negative side effects are likely to still be lower than the negative effects of not incentivizing a manager at all.

4.6.4 Conclusion

The two previous sections looked at empirical findings regarding the effects of incentive payment on company performance and executive actions. Surveying the literature, it became evident that although the results regarding the effectiveness of pay on performance remain inconclusive, they tend slightly towards only marginal effects. This, however, does not mean that incentive payment as a whole has only marginal effects. It could very well be that the companies analyzed by some of these empirical studies simply did not properly design their management compensation systems or used performance measures that were not in line with preference similarity.
Furthermore, many empirical papers found that incentive payment led to executives engaging in short-term and manipulative behavior. Yet, as pointed out in the previous section, this need not imply that incentive payment promotes behavior harmful to the shareholders. Indeed, it could be possible that the side effects of incentive payment are due to the improper design of compensation systems or are still less harmful than abstaining from incorporating incentive payment into compensation systems.

What the cited empirical studies certainly do is give rise to the question of whether or not the design of compensation systems based on the principles of agency theory and preference similarity is sufficient for properly incentivizing managers to act on behalf of the shareholders.

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[409] See Dalton et al. (2007), p. 33.

4.7 Criticism of Management Compensation Systems based on Agency-Theoretical Concepts

Critics of agency theory have used the empirical findings presented in the previous section to criticize not only its use within the realm of compensation systems but also overall. Often, they criticize the basic assumptions of the theory, especially the characterization of humans as being opportunistic and narrowly self-interested. For example, Donaldson and Davis hold these assumptions to be overly negative and cynical[410] while Davis, Schoorman, and Donaldson proclaim that these assumptions are not applicable in all situations.[411]

Moreover, as for instance Wiseman, Cuevas-Rodriguez, and Gomez-Mejia state, the measures imposed to counteract the assumed behavior of humans within agency-theoretical concepts have promoted a self-fulfilling egotistical economic logic.[412] Ghoshal seconds this, suggesting that the widespread use of agency theory and similar concepts may have had adverse effects to those expected. Instead of reducing agency problems, its use may have rather enhanced the behaviors that agency theory assumes.[413] Consequently, he criticizes academic research in this realm as many researchers would focus too much on the negative/amoral behavior of people and would be too pessimistic in their assumptions regarding human nature.[414]

Kaufman and Englander even go as far as to say that financial agency theory and especially the concept of maximizing shareholder value encouraged the management scandals of the 1990s.[415] Overall, they question the use of the concept of agency theory within management compensation and express their surprise that "[…] this mantra still guides reforms for correcting the very problem it helped cause."[416]

Other authors do not go as far as those in the previous paragraph but still reprimand the theory for its narrow assumptions that drastically restrict its usability in the real world. In this regard, Thaler criticizes the lack of distinction in task difficulty when applying agency-theoretic concepts, arguing that these concepts assume that "[…] people are equally good at deciding how many eggs to buy for breakfast and solving for

410 See Donaldson/Davis (1991), p. 60; Donaldson/Davis (1994), p. 159.
411 See Davis/Schoorman/Donaldson (1997), p. 43.
412 See Wiseman/Cuevas-Rodríguez/Gomez-Mejia (2012), p. 217.
413 See Ghoshal (2005), p. 89.
414 See Ghoshal (2005), p. 85.
415 See Kaufman/Englander (2005), p. 9.
416 Kaufman/Englander (2005), p. 9.

the right amount to save for retirement."[417] This idea is widespread amongst critics of agency-theoretical concepts and gave rise to the concept of "bounded rationality". This concept assumes that there are limits to the cognition of individuals which severely restrict their real-life capabilities in decision-making. These restrictions run counter to the idea of full rationality expressed in agency-theoretical concepts.[418] The reasoning behind "bounded rationality" will be discussed in further detail in Section 5.2.

Further criticism centers around the use of simplistic assumptions regarding individual risk preferences which are claimed to be too narrow-minded.[419] Authors like Charness criticize its lack of social context in that agency theory presumes "[…] that people maximize their own financial interest, without regard for social norms and issues such as fairness and reciprocity."[420] While the former spawned theories like "Prospect Theory" (discussed in the Section 5.3), the latter makes a compelling case for incorporating social aspects into agency-theoretic concepts as well as the design of compensation systems. For instance, Wiseman, Cuevas-Rodriguez, and Gomez-Mejia advocate the introduction of the social context in principal-agent interactions, as well as further research on how this social context interacts with the mechanisms developed by agency-theoretic concepts.[421]

To sum up, the majority of criticism centers around the simplifications that theoretical models within the realm of agency theory apply when determining measures and recommendations that can ameliorate agency problems. In particular it is the behavioral assumptions that form the basis of agency theory and its lack of social context that have been subject to the harshest criticism and which have led to the call for the incorporation of behavioral elements into agency-theoretical concepts and the design of management compensation systems.[422]

Even if these criticisms make a case for the big weaknesses that recommendations regarding management compensation systems based on agency-theoretical concepts could have, it is imperative to remember that these concepts are only models that provide a framework that helps to analyze problems that occur in practice. Essentially, these concepts provide solutions that are applicable in optimal situations based on the assumptions they make. Consequently, utilizing these concepts in practice can only be

417 Thaler (2016), p 1580.
418 See Williamson (1975), pp. 21-22; March (1994), p. 8.
419 See Wiseman/Gomez-Mejia (1998), p. 134.
420 Charness (2004), p. 665.
421 See Wiseman/Cuevas-Rodríguez/Gomez-Mejia (2012), p. 217.
422 See Davis/Schoorman/Donaldson (1997), pp. 42-43; Tirole (2002), p. 652; Zogning (2017), p. 5.

as a yardstick, a direction in which systems should be designed. Yet, and this is extremely important, they have to be adjusted when put into practice.

This is of particular importance given how difficult it is to reflect human nature in theoretical models. Therefore, the present study does not distance itself from the agency-theoretical concepts or its recommendations. Instead, it suggests that behavioral aspects have to be taken into account if one wishes to properly design compensation systems that not only consider the agency problems between managers and shareholders but also incorporate human nature when attempting to solve them.

Consequently, the following chapter will introduce a number of different concepts emanating from the realm of behavioral economics and will attempt to integrate their results into the recommendations made in Section 4.5. This is done to provide readers with a comprehensive guideline for the design of compensation systems which can help to alleviate some of the problems stemming from the strict and narrow assumptions made in agency-theoretical concepts.

5 Compensation Systems Under Behavioral Economics

5.1 Introduction

The concept of behavioral economics attempts to analyze the psychological motives of people and their behavior in order to incorporate these findings into an economic context. This is done with the intention of increasing the realism of economic models and thus being able to make better predictions of human economic behavior. These better predictions can consequently be used for better policies and recommendations. At first glance, the findings regarding the psychological motives of individuals are very difficult to combine with the neoclassical economic models.[423] Some authors call predictions made by the neoclassical models "[…] predictions that are not borne out by actual behavior […]."[424] However, behavioral economics does not reject these models. Neoclassical models are still useful as theoretical frameworks through which their predictions serve as the base for theorizing about human behavior within economics.[425]

The idea of incorporating psychological motives into economical models is not new. Indeed, as early as the 18th century, Adam Smith set out theories on important concepts of behavioral economics. For example, he commented that "[w]e suffer more [...] when we fall from a better to a worse situation, than we ever enjoy when we rise from a worse to a better."[426] This is similar to the concept of loss aversion, which will be introduced in Section 5.3.2.2. Smith also commented on the concepts of overconfidence ("The over-weening conceit which the greater part of men have of their own abilities is an ancient evil remarked by the philosophers and moralists of all ages."[427]) and self-control ("The pleasure which we are to enjoy ten years hence interests us so little in comparison with that which we may enjoy to-day […].")[428] Others, like Jeremy Bentham, Irving Fisher, and Vilfredo Pareto still incorporated behavioral elements concerning the feeling and thinking of people into their theories at the beginning of the 20th century.[429] John Maurice Clark even went as far as to say that "[t]he economist may attempt to ignore psychology, but it is a sheer impossibility for him to ignore

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423 See Beck (2014), pp. 9-10.
424 Slovic/Fischhoff/Lichtenstein (1977), p. 11.
425 See Camerer/Loewenstein (2004), p. 3.
426 Smith (2002), p. 249.
427 Smith (2007), p. 88.
428 Smith (2002), p. 222.
429 See Camerer/Loewenstein (2004), pp. 4-5.

human nature, as his science is a science of human behavior. […] If the economist borrows his conception of man from the psychologist, his constructive work may have some chance of remaining purely economic in character. But if he does not he will not thereby avoid psychology. Rather he will force himself to make his own, and it will be bad psychology."[430]

Newer concepts of behavioral economics which sought to bridge the gap between themselves and agency theory were developed in the second half of the 20th century. As Eisenhardt stated, agency theory "[…] is an empirically valid perspective, particularly when coupled with complementary perspectives."[431] One of the most well-known models is the so-called "behavioral agency model" developed by Wiseman and Gomez-Mejia,[432] which has pronounced distinctions compared to the classical agency theory: First of all, the concept incorporates a deeper understanding of risk, moving away from stable risk preferences and towards risk-taking behavior depending on the context of an action. Second, it introduces elements like prior experiences with risky choices and different behavior regarding losses and gains into an individual's decision making.[433] Other authors like Sanders or Sanders and Carpenter use the findings of behavioral research to theorize about executive compensation. This is done with the intention of achieving a better understanding of executive behavior so as to help design better compensation plans.[434]

In this mold, Sections 5.2 to 5.7 will introduce different elements from behavioral economics and attempt to connect them to managerial compensation design. Section 5.8 will then summarize the findings drawn from Sections 5.2 to 5.7 and provide a comprehensive overview of the recommendations that can be gained from the elements of behavioral economics.

5.2 Bounded Rationality

5.2.1 Basics of Bounded Rationality

As seen in Chapter 4, in classical and neoclassical models, the rational individual is focused on maximizing his own expected utility. To achieve this, he is assumed to be equipped with unlimited cognitive capabilities, the ability to immediately perform

[430] Clark (1918), p. 4.
[431] Eisenhardt (1989a), p. 57.
[432] See Wiseman/Gomez-Mejía (1998).
[433] See Finkelstein/Hambrick/Cannella (2009), pp. 337-338.
[434] See Sanders (2001); Sanders/Carpenter (2003).

computations no matter how difficult they are, and the solutions to all mathematical problems.[435] These assumptions have been criticized by several authors. As Slovic, Fischhoff and Lichtenstein put it, Expected Utility Theory models make "[…] predictions that are not borne out by actual behavior […]."[436] Humans in reality act quite differently: They only possess limited cognitive capabilities and, as studies have shown, their decision-making behavior does not suit the assumption and ideal of full rationality.[437] They are boundedly rational.[438]

In his book on decision-making, March divides the reasons for the above-mentioned, observed behaviors into four categories: *Problems of attention* are caused by the limited time and capabilities of individuals to pay attention and the overload of signals they receive. *Problems of memory* are the result of the limited capabilities of individuals to store information, while *problems of comprehension* have their roots in the failure of individuals to see the relevance of the information they possess. Finally, *problems of communication* are caused by shortcomings in sharing complex and specialized information.[439]

Simon names three other restrictions on cognition. Influenced by the works of positivist psychologists, he redefines human rationality to integrate the innate biological and rational bounds that cause deviations from the full rationality of the models discussed in Chapter 4.[440] According to Simon, the restrictions on human cognitions are the incompleteness or unreliability of available information, the limitations of the human mind regarding its cognitive and computational capacity, and the constrained time limit for decision-making.[441] A manager cannot have an overview of or examine every organizational and environmental aspect. Equally he cannot observe all phenomena in his field of vision. Rather, his field of vision—namely his area of attention—is restricted and poses strict limitations on his overall perception. Consequently, he only selectively perceives certain phenomena.[442]

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435 See Simon (1955), p. 99; Selten (2001), p. 14; Foss (2010), p. 135.
436 Slovic/Fischhoff/Lichtenstein (1977), p. 11.
437 See Williamson (1975), pp. 21-22; March (1994), p. 8.
438 It is important to distinguish between the concept of bounded rationality and the concept of irrationality that e.g. causes individuals to believe in lucky numbers or results in abnormal behavior. Boundedly rational individuals still try to behave in a rational way.
439 See March (1994), p. 10.
440 See Simon (1955), p. 114; Simon (1956), pp. 130-131.
441 See Simon (1955), p. 254; Simon (1957), p. 266.
442 See Hambrick/Mason (1984), p. 195.

To sum up the reasoning of both March and Simon, it is possible to say that individuals are boundedly rational due to their limited cognition and the restrictions imposed on them by the environment in which they work.

One consequence of this bounded rationality is the necessity of non-optimizing procedures in the decision-making process. As job demands of executives increase, the number of stimuli they receive broadens, while simultaneously they will comprehend a diminishing amount of these stimuli. Being put under such performance pressure, executives neither possess the time nor the cognitive resources for comprehensive analyses or exhaustive explorations of solutions.[443] To cope with these cognitive constraints and optimize cognitive effort, several methods have been devised, such as short-cuts (heuristics)[444] and framing.[445] Ultimately, people rather make "satisficing" than "optimal" decisions. Their chosen alternative fulfills a certain need or passes a certain threshold on each criterion established before the search. However, it does not necessarily maximize expected utility. The search ceases once a satisficing alternative has been found, even if other alternatives with higher expected utility are still available.[446]

After a brief overview of the concept of bounded rationality and its consequences, the following two sections deal with two models of human perception and decision-making to help better understand the processes behind bounded rationality. The first model by Kahneman divides the human thought process into two parts, distinguishing between intuition and reasoning. The second model by Finkelstein, Hambrick, and Cannella focuses on a strategic decision-making process under bounded rationality and its consequences.

5.2.2 Two System Model by Kahneman

In his model of thought and judgment, Kahneman distinguishes two different parts: intuition and reasoning. The distinction between these two concepts has been a topic of considerable interest over the last thirty years[447] and has been present for a very

[443] See Eisenhardt (1989b), pp. 570-572; Hambrick/Finkelstein/Mooney (2005a), p. 478.
[444] See Newell/Simon (1972), pp. 158-159.
[445] See March (1994), pp. 13-14.
[446] See March (1994), p. 19.
[447] See Epstein (1994), pp. 709-710; Evans (2003), p. 454.

long time, even going back as far as the 19th century.[448] It was used in an attempt to reconcile contradictory results in studies concerning judgment under uncertainty.[449]

Kahneman builds on the characteristics that Stanovich and West developed whilst separating the human cognitive process into two types: System 1 and System 2.[450] His model, as seen in *Figure 3* below, comprises perception, intuition (System 1), and reasoning (System 2). Common to both systems is the fact that they are not restricted to processing current stimulation only. The processes behind System 1 have similar features as perceptual processes and can be described as fast, effortless, and emotionally charged. As they are guided by habit, they are automatic and difficult to control. Meanwhile, the processes behind System 2 are slower, effortful, and consciously monitored. Contrary to System 1, processes in System 2 are relatively flexible and controllable.[451]

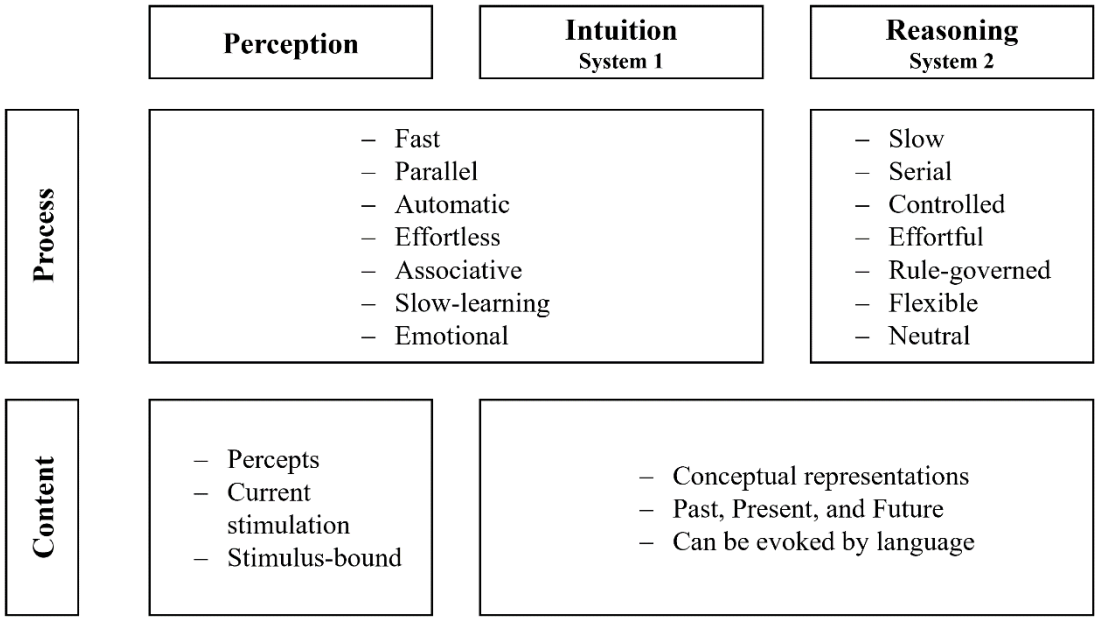

Figure 3: The Two Cognitive Systems of Judgement and Choice[452]

A good example to see how the two systems inside the model differ is given by Kahneman when looking at two concurrent cognitive tasks: Combining effortless processes belonging to System 1 does not cause any interruptions or interferences, as these processes are effortless and can be dealt with in parallel. However, combining two

[448] See Evans (2003), pp. 914-916.
[449] See Kahneman/Frederick (2002), pp. 51-52.
[450] See Stanovich/West (2000), p. 658.
[451] See Stanovich/West (2000), p. 658; Evans (2003), p. 454; Kahneman (2003), p. 698.
[452] Own Depiction based on Kahneman (2003), p. 698.

effortful processes belonging to System 2 leads to disruptions as cognition is limited and the capacity for mental effort restricted.[453]

The two systems in this model, however, do not work on a purely isolated basis. Perception combined with the intuition of System 1 "[…] generate impressions of the attributes of objects of perception and thought."[454] These generated impressions are not voluntary, contrary to the judgments of Systems 2, which are intentional and explicit. As a consequence, System 2 is constantly involved in all judgments, independent of their source and, thus, independent of these judgments being formed by impressions or conscious reasoning. Its task is to monitor the quality of the mental operations as well as the visible behavior.[455]

In spite of this constant involvement of System 2, according to Kahneman judgments based on impressions are usually only monitored in an imprecise manner, leaving room for flawed intuitive judgments to be expressed.[456] In a study using simple puzzles to observe cognitive self-monitoring, Frederick attributed the high rate of errors to the weak monitoring of System 1 by System 2.[457] This confirms the assumptions made by both Simon and March regarding limited cognitive capabilities and the constrained time limit for decision-making. Thus, rather than thinking long and intensively using System 2, individuals often fall back on judgments made by System 1 which are much faster and easier to obtain. This means that Kahneman's model can be used to explain parts of the behavior attributed to bounded rationality.

5.2.3 Strategic-Decision-Making Model by Finkelstein, Hambrick, and Cannella

Developed by Finkelstein, Hambrick, and Cannella, the second model deals with the processes of human thinking in the realm of strategic decision-making.[458] Research has shown that managerial cognition will affect strategic decision-making and, consequently, organizational outcomes.[459] When making decisions, an executive's cognitive frame plays an important role as regards the direction and magnitude of his decision-making. *Figure 4* shows the complete process, beginning with the strategic situation

[453] See Kahneman (2003), p. 698.
[454] Kahneman (2003), p. 699.
[455] See Kahneman (2003), p. 699.
[456] See Kahneman (2003), p. 699.
[457] See Kahneman (2003), p. 699.
[458] See Finkelstein/Hambrick/Cannella (2009), p. 44.
[459] See Stephan et al. (2003).

and ending in the organizational performance based on the strategic choices made by the executive.

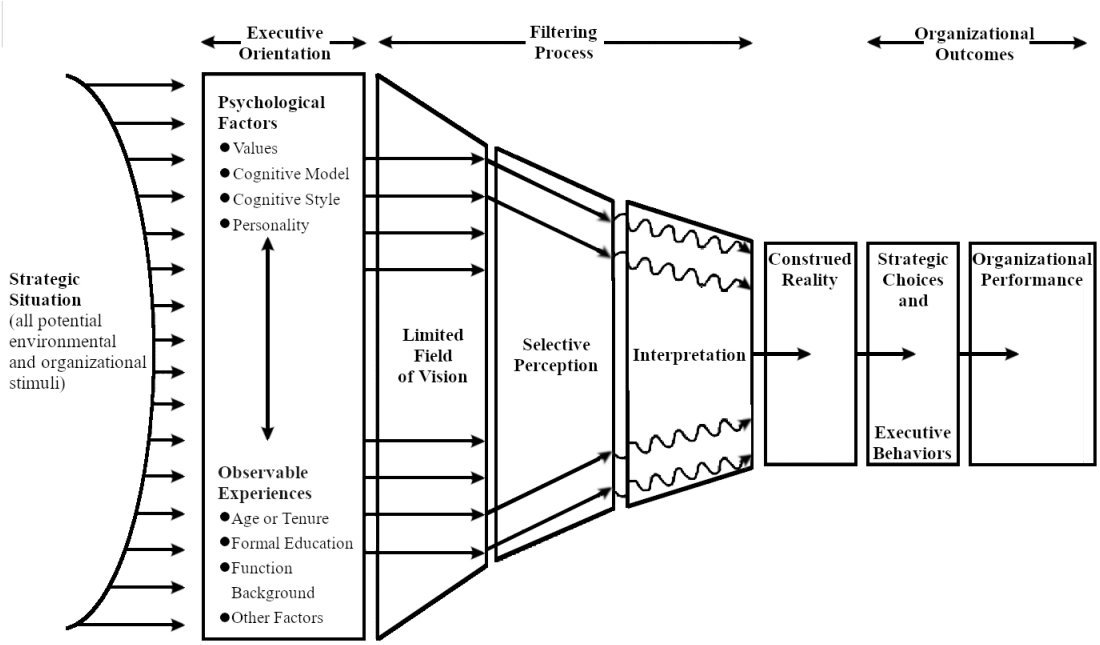

Figure 4: Strategic Decision-Making Under Bounded Rationality[460]

When making a choice, the executive is first faced with the overall strategic situation, which contains all potential stimuli. For one, these could be internal, coming from within the organization, such as cost structures, technological capabilities, or workforce morale. For another, elements like geopolitical factors or the company's competition can be attributed to the environment in which the executive operates and thus are external.

The overall number of stimuli the executive receives far outnumbers the amount that he can fully comprehend. Additionally, many of the stimuli may be ambiguous, contradictory, or prone to misinterpretation.[461] Research on environmental scanning supports this notion, finding that a given executive cannot scan everything that might be relevant.[462] As posited by Simon (see Section 5.2.1), this overload of stimuli leads the executive to take mental shortcuts. Not only does the executive attempt to find a "satisficing" alternative, he will also lean heavily on his own background and experiences, employing processes that have been successful in the past[463] or imitate the strategic actions of other firms.[464]

460 Own Depiction based on Finkelstein/Hambrick/Cannella (2009), p. 44.
461 See Finkelstein/Hambrick/Cannella (2009), p. 46.
462 See Daft/Sormunen/Parks (1988), p. 123; Waller/Huber/Glick (1995), p. 943.
463 See Hambrick (2007), pp. 335-336.
464 See Hambrick/Finkelstein/Mooney (2005a), pp. 479-480.

Subsequently, the stimuli received are processed in several steps, passing several filters, until the executive ends up in a "construed reality" of the situation he faces, which serves as the basis of his final decision-making. The so-called "executive orientation" and the "filtering process" were introduced by Finkelstein, Hambrick, and Cannella, to integrate human shortcomings and biases regarding individuals' bounded rationality.

"Executive orientation" builds on a multitude of human factors, combining psychological (e.g. values, cognitive style, and personality) as well as observable characteristics (e.g. age, formal education or tenure on the job). It connects the basic premise of bounded rationality with the concept of "Upper Echelons" (UE), which postulates that executive cognition, values, and perceptions influence the process of strategic choice and resultant performance outcomes. According to UE theory, faced with decision challenges like information overload, ambiguous cues, and competing goals and objectives, executives filter and interpret the stimuli they receive through cognitive bases and values,[465] the psychological factors and observable experiences shown in *Figure 4*.

The concept of values used in this model is based on Hambrick and Mason's work and defines them as principles for ordering consequences and alternatives according to preference.[466] These values, Hambrick, Finkelstein, and Cannella argue, have a significant influence on the overall choice made, as they can determine choice ("behavior channeling") and shape the executive's perception in a way that he filters the information available so that it fits his limited field of vision, underlying values, and beliefs ("perceptual screening").[467]

Having passed the "executive orientation", the stimuli are then processed in a three-stage filtering process. As the executive cannot capture and fathom all information available, he first distills and then interprets the information he deems important.

The first step of filtering occurs due to the executive's "limited field of vision". The size and complexity of his organization and its environment as well as the effort he puts into scanning for potential stimuli significantly affect the number of stimuli he perceives.[468] Research in environmental scanning has shown that individual executives

[465] See Hambrick/Mason (1984), pp. 195-196; Carpenter/Geletkanycz/Sanders (2004), p. 750; Hambrick (2007), p. 334.
[466] See Hambrick/Mason (1984), p. 195.
[467] See England (1967), pp. 54-55; Geletkanycz (1997), p. 617.
[468] See Finkelstein/Hambrick/Cannella (2009), p. 47.

not only vary in the effort they put into scanning, but also in the number of sources they choose to scan.[469]

Having reduced the available stimuli due to the limited field of vision of the executive, these are further curtailed in the second stage due to "selective perception". Finkelstein, Hambrick, and Cannella argue that the executive will not subsequently process all information available in his field of vision in an equal manner. Whilst certain information will only be registered on a subconscious level or even disregarded entirely, other stimuli will leave a lasting impression and be remembered vividly.[470] Taking an analytical report as an example, it matters not only what information it contains, but also who wrote it, how it is written, and how closely it mirrors the executive's own beliefs and opinions.[471]

Finally, after reducing the available stimuli in the previous two steps, the third step sees the executive interpret the information he possesses. According to Starbuck and Milliken, several processes now take place: comprehension, understanding, explanation, extrapolation, and prediction.[472] Executives not only differ in interpreting the same information, they also vary in their choices of actions drawn from this information.[473] Therefore, the same set of stimuli can produce widely differing judgments and consequent actions as the "construed reality" each executive perceives is unique and may differ substantially from executive to executive.[474]

Overall, standing between the original strategic situation with all its potential stimuli and the subsequent strategic choices that lead to organizational performance are human factors based on the executive's personality and the bounded rationality innate to humans. [475]

As could be inferred from Simon's work as well as the models presented, the description of humans as boundedly rational has profound implications on the design of compensation systems. First of all, incentive systems devised for executives should heed the bounds of human rationality, especially the limits on cognition, and should not be excessively complex. Otherwise, the link between a managerial action and the subsequent reward for it may be lost leading to no/only very low levels of motivation

469 See Hambrick (1982), p. 159.
470 See Finkelstein/Hambrick/Cannella (2009), pp. 47-48.
471 See Finkelstein/Hambrick/Cannella (2009), pp. 47-48.
472 See Starbuck/Milliken (1988), pp. 58-60.
473 See Milliken (1990), p. 42.
474 See Finkelstein/Hambrick/Cannella (2009), pp. 48-49.
475 See Finkelstein, Hambrick, Cannella (2009), pp. 48-49.

stemming from the incentive system. Furthermore, to avoid overly strong individual filtering and interpretation, incentive systems should be constructed in a clear, concise, simple, and comprehensible manner.

5.3 Prospect Theory

5.3.1 Basics of Prospect Theory

A model that captures principles of bounded rationality is the so-called Prospect Theory, a behavioral decision theory developed by Kahneman and Tversky. Drawing on findings from within the realm of behavioral decision theories, Kahneman and Tversky devised Prospect Theory, a purely descriptive theory of choices under uncertainty, which offers a behavioral alternative to utility theory regarding individual decision-making. Later on, Kahneman and Tversky devised an updated version of Prospect Theory, Cumulated Prospect Theory, which modifies several assumptions of the original theory. To constantly satisfy stochastic dominance and extend the theory to a large number of outcomes, both points of contention of the original theory, Kahneman and Tversky introduced a rank-dependent/cumulative distribution weighting function.[476] However, even Kahneman and Tversky themselves expressed doubts about "[…] whether the gain in descriptive validity […] would justify the loss of predictive power and the cost of increased complexity."[477] For this reason, section 5.3 will deal with the original theory, as the elements needed for the final recommendations on executive compensation can unproblematically be taken from Prospect Theory itself.

Prospect Theory especially challenges the assumptions of Expected Utility Theory through three core elements which will be presented in the following chapters. First, Expected Utility Theory assumes that an individual will display either risk-averse, risk-neutral or risk-seeking characteristics—both when experiencing a gain and a loss. Contrary to this, Prospect Theory proposes that individuals are risk-averse in gains and risk-seeking in losses, shown by the theory's value function of which the slope is steeper for losses than for gains (Section 5.3.2). Second, while under Expected Utility Theory an individual evaluates his utility from final states of wealth which not only include the current prospect but also the individual's previously existing assets, Prospect Theory evaluates utility based on changes from wealth emanating from the strategic situation faced by an individual (Section 5.3.2). Finally, contrary to the use of

[476] For further information about the differences and Cumulative Prospect Theory itself, see Tversky/Kahneman (1992).
[477] Tversky/Kahneman (1992), p. 317.

stated probabilities to calculate the expected utility an individual receives from a prospect, Prospect Theory proposes the use of decision weights for each potential outcome which differ from the stated probabilities except for extreme outcomes (Section 5.3.3).

5.3.2 The Value Function

5.3.2.1 Properties of the Value Function

One of the main grounds for the development of Prospect Theory's value function was the fact that humans do not evaluate outcomes based on final states but rather relative to certain reference points. As Kahneman and Tversky argue, a human's perceptual apparatus is apt to recognize and evaluate changes and be rather anemic at assessing final states.[478] For example, experiencing a certain brightness as either dim or bright highly depends on the context and the previous state to which the individual was exposed—his reference point. Consequently, Prospect Theory abandons Expected Utility Theory's decisions based on final wealth positions and postulates that people divide outcomes into gains and losses relative to a neutral reference point.[479]

However, it is important to note that this does not imply that choices are completely independent of the initial starting position and only hinge on the value of change. In financial terms, the original asset position of an individual serves as the reference point from which the utility of change is evaluated. Therefore, the same change of wealth can mean very little for one person, whilst it signifies a great improvement for another.[480]

The value function that Kahneman and Tversky use for Prospect Theory also incorporates diminishing sensitivity, founded in the fact that, as they explain, humans' sensual and perceptual apparatuses share the same property of diminishing responses to the amount of change. For example, the difference in value between a gain (loss) of 100 to one of 500 is perceived much more strongly than the difference between a gain (loss) of 10,100 and 10,500. The marginal value of a change hinges on its magnitude. This property results in the value function depicted in *Figure 5* below: Being concave above the reference point ($v''(x) < 0$, for $x > 0$) and convex below it ($v''(x) > 0$, for $x < 0$).[481]

Although the concept of diminishing sensitivity used in Prospect Theory seems similar

[478] See Kahneman/Tversky (1979), p. 277; Kahneman/Tversky (2003), p. 32.
[479] See Kahneman/Tversky (1979), p. 274; Kahneman (2003), p. 703.
[480] See Kahneman/Tversky (2003), p. 32; Holmes et al. (2011), p. 1076.
[481] See Kahneman/Tversky (1979), pp. 277-279; Kahneman/Tversky (2003), pp. 32-33; Holmes et al. (2011), p. 1076.

to the fact that under Expected Utility Theory, the marginal changes of utility through added wealth decrease with an individual's absolute wealth position, there is a significant difference. Under Prospect Theory, the marginal changes in subjective value depend on the distance of possible outcomes from the reference point of an individual no matter his final absolute wealth. Therefore, the diminishing sensitivity is based on the margin of change and not the final wealth position.[482]

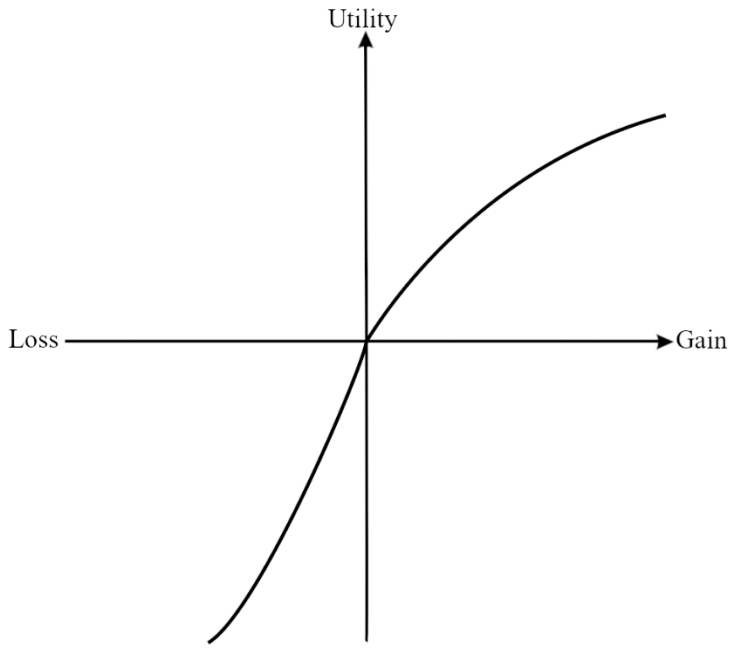

Figure 5: The Value Function of Prospect Theory[483]

A salient characteristic of the value function's shape is a concept that Kahneman and Tversky describe as loss aversion.[484] Loss aversion postulates that people value a loss stronger than an equal gain. Therefore, for losses, the slope of the value function is assumed to be steeper than for gains, based on the fact that empirical experiments have shown the value change for a loss to outweigh that for an equal gain by roughly 2 to 1.[485] For instance, most people shy away from symmetric bets in the form of

$$(y, 0.5; -y, 0.5)$$

where y is the amount at stake and 0.5 the probability of either winning or losing y. As a result, $|u(y)| < |u(-y)|$, meaning that the gain in utility in a symmetric bet is lower than the loss in utility. Consequently, individuals have a strong tendency to

[482] See Holmes et al. (2011), p. 1076.
[483] Own Depiction based on Kahneman/Tversky (1979), p. 279.
[484] See Kahneman/Tversky (1984), p. 342; Kahneman/Tversky (2003), pp. 33-34.
[485] See Kahneman (2011), p. 285; Beck (2014), p. 128.

remain at the status quo as the potential disadvantages of a loss outweigh the advantages of a gain.[486]

To sum up the properties of the value function of Prospect Theory, one can say that it evaluates deviations from the reference point, is concave for gains and convex for losses, and steeper for losses than for gains. The resulting S-shape can be seen in *Figure 5*.

5.3.2.2 The Importance of Loss Aversion

As seen in the previous section, most people find symmetric bets visibly unattractive. For them, a loss bears nearly twice as much reduction in subjective value than an equal gain provides an increase. This is reflected in the value function of Prospect Theory, as the slope of it is steeper for losses than for gains. Kahneman and Tversky named this characteristic "loss aversion" and it is not only one of the most important ideas incorporated into their theory, but also extremely helpful when thinking about decision-makers.

Supporting the notion of loss aversion, several studies have found that decision-makers willingly accept greater uncertainty to avoid a loss.[487]

Additionally, individuals facing a loss become more risk-seeking the higher the probability for a loss. In a gain context, however, the higher the anticipated probability for a gain, the more risk-averse individuals become. This is explained by the fact that they do not want to take any "unnecessary" risks jeopardizing the gains they anticipate as being assured.[488] Facing the choice between obtaining €1,000 with certainty or €2,000 with a probability of 50%, people tend to choose the certain amount to avoid uncertainty. However, when choosing between losing €1,000 for certain or losing €2,000 with a probability of 50%, many people take the gamble. This phenomenon in the context of a loss contradicts the traditional assumptions of risk aversion under Expected Utility Theory, whereby decision-makers would accept lower returns to circumvent uncertainty.

Furthermore, loss aversion can lead to the preference of an individual for his current situation (the status quo). Most of the time, trying to move away from the status quo can involve the chance of a loss. As Gintis argues, on average, gains do not offset losses[489] and, keeping in mind that people, on average, value losses twice as much as

[486] See Kahneman/Tversky (1984), p. 348; Kahneman/Tversky (2003), p. 162.
[487] See Mowen/Mowen (1986); Highhouse/Paese (1996).
[488] See Tversky/Kahneman (1992), pp. 316-317; Martin et al. (2015), p. 485.
[489] See Gintis (2000), p. 316.

equal gains, it is likely that no alternative present for the decision-maker is preferred to the current status quo.

Another ramification of loss aversion is the so-called endowment effect,[490] which postulates that decision-makers place higher values on things (e.g. cars, money, stock options) in their possession compared to the same things if they do not possess them. This divergence in valuation expounds the preponderance of decision-makers to rather accept opportunity costs (foregone gains) than out-of-pocket costs (loss of possession).[491] Loewenstein and Adler researched this endowment effect and allowed test subjects to value coffee mugs which were not in their possession. Later, the same test subjects were given the same type of coffee mug and then asked to name a selling price which was subsequently higher than the value they had previously given to the mug—evidence for the existence of the endowment effect. Through further testing, the authors also found that people underestimate the endowment effect and are subsequently unable to correct for its existence when making a decision.[492]

5.3.3 The Probability Weighting Function

In addition to the value function, Prospect Theory also contains the so-called probability weighting function which is used to convert the probabilities of outcomes within a decision into decision weights. These decision weights are composed of an outcome's probability of occurring and a subjective component. They are subsequently multiplied with the value of each possible outcome to arrive at the individual's utility.[493]

As decision weights are not probabilities, "[…] they do not obey the probability axioms and they should not be interpreted as measures of degree or belief […]"[494] or the likelihood of an outcome occurring. Rather, they exhibit an individual's preference for the said outcome.

In its basic form, the probability weighting function and thus the basis for evaluating alternatives can be written as follows:[495]

$$\varphi(y_1, p; y_2, q) = \pi(p)u(y_1) + \pi(q)u(y_2)$$

[490] See Kahneman/Knetsch/Thaler (1991), p. 194.
[491] See Kahneman/Knetsch/Thaler (1991), pp. 203-204.
[492] See Loewenstein/Adler (1995), pp. 935-936.
[493] See Kahneman/Tversky (1979), p. 280; Kahneman/Tversky (2003), p. 34.
[494] Kahneman/Tversky (1979), p. 280.
[495] See Beck (2014), p. 128.

y_1 and y_2 represent the possible results of a decision made, while p and q denote the probabilities attached to these results. $\pi(\cdot)$ then is the function that transforms the probabilities into the decision weights.

Even though the decision weights do not act like probabilities, there are still certain points were both coincide:[496] $\pi(0) = 0$ (outcomes that are impossible to occur are being ignored) and $\pi(1) = 1$ (the weighting scale is normalized, "[…] so that $\pi(p)$ is the ratio of the weight associated with the probability p to the weight associated with the certain event.")[497] Also, if the expectation principle holds, both scales will coincide, i.e. $\pi(p) = p$.

Another characteristic of Prospect Theory's weighting function is the subadditivity for low probabilities: $rp > r\pi(p)$ for $0 < r < 1$.[498] Additionally, Kahneman and Tversky suggested that the subjective likelihood of an event with a very low probability occurring is generally overweighed, such that $\pi(p) > p$ for very low probabilities.[499]

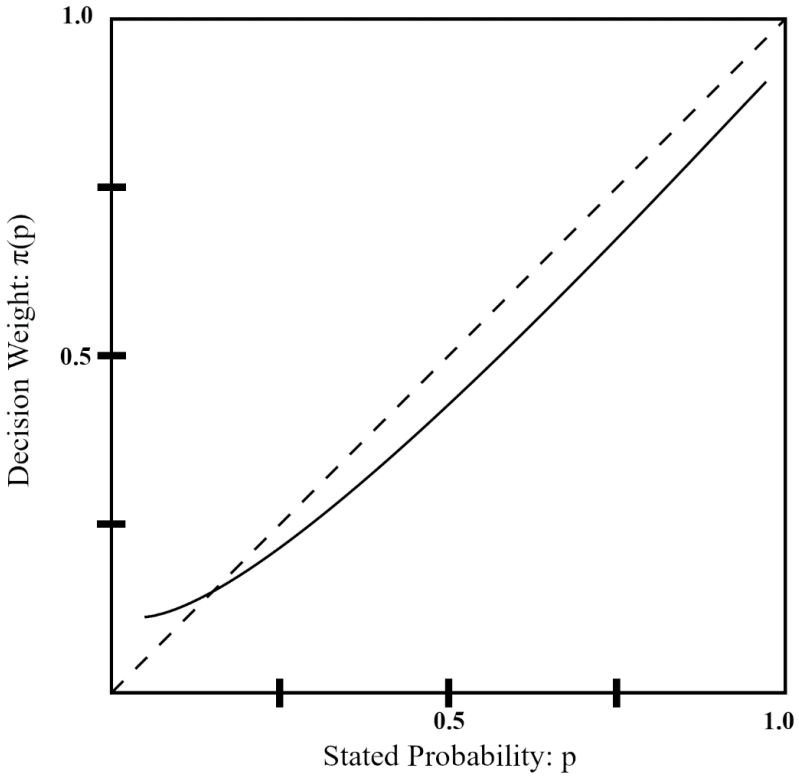

Figure 6: The Weighting Function of Prospect Theory[500]

[496] See Beck (2014), p. 128.
[497] Kahneman/Tversky (2003), p. 35.
[498] See Beck (2014), p. 134.
[499] See Kahneman/Tversky (2003), p. 35.
[500] Own Depiction based on Kahneman/Tversky (1979), p. 283.

Finally, the weighting function also incorporates the principle of subcertainty, meaning that for all $0 < p < 1$, $\pi(p) + \pi(1-p) < 1$. As Kahneman and Tversky argue, preferences are less sensitive to variations of probabilities than the expectation principle states and "[…] the sum of the weights associated with complementary events is typically less than the weight associated with the certain event."[501] To account for this, they introduced the principle of subcertainty and set the slope of π in the weighting function so that it measures an individual's sensitivity of preferences to changes in probability.[502]

Overall, the weighting function of Prospect Theory enhances elements from bounded rationality, especially when it comes to strategic decision-making under uncertainty. Individuals do not evaluate outcomes based on their real probabilities but rather place subjective weights on those outcomes, weights that are influenced by personal experiences and beliefs.

5.3.4 Prospect Theory and Executive Compensation

Overall, Prospect Theory's most important elements, namely its value function and its weighting function have important indications for executive compensation— especially when it comes to the share of stock within an executive's overall wealth. Contrary to the other shareholders, he would not be properly diversified on the stock market and would consequently see risky decisions in a different light than them.

First of all, in their value function, Kahneman and Tversky introduced the concept of loss aversion—people's inclination to value losses stronger than equal gains. Combined with the endowment effect—rating out-of-pocket costs stronger than opportunity costs—one can infer an executive's desire to maintain the status quo when his stock is valued higher than the current reference point. This especially holds true if stock constitutes a large share of an executive's overall wealth.

Additionally, according to the weighting function, individuals overweigh outcomes considered to be certain relative to merely probable ones.[503] Once a stock is above the reference point, executives may see their current potential gain as certain and further increases as merely probable. In this case, executives may endow the new value of their stock, so that their reference point shifts to that new value. Consequently, any drop in stock price would be perceived as a loss rather than a reduction in gain. As

[501] Kahneman/Tversky (2003), p. 36.
[502] See Kahneman/Tversky (2003), p. 36.
[503] See Aaron et al. (2014), p. 340.

losses loom larger than gains (steeper slope of the value function in the loss region), an executive rather prefers to stay at the status quo. Also, due to the overweighing of the certain gain relative to the merely probable chance for a further increase, executives have a further incentive to remain at the status quo. By adopting a more defensive firm strategy and thus reducing company risk until the vesting of his stock, an executive would achieve this goal, as he would reduce the risk of threatening his personal wealth. This behavior, however, cannot be in line with the interests of the company's shareholders and therefore stock would not fulfill the requirements needed for proper performance indicators.

The opposite of risk reduction under loss aversion may also hold true, leading to further misalignment in incentives. If an executive's stock falls below the reference point, Prospect Theory predicts additional detrimental behavior. As Brunnermeier suggests, individuals exhibit a diminishing sensitivity to losses. Losses around an individual's reference point will weigh upon his utility much heavier than an equal loss deep in the loss region.[504] This would lead an executive to be more willing to take risks to recuperate his losses after a large perceived loss. His risk aversion would then shift to risk-seeking, but at a level higher than desired by shareholders.
Aaron et al. name another possible effect of large losses, suggesting that executives may become disheartened, deeming the possibility of recuperating the losses to be too low.[505] Therefore, the authors suggest that "[…] the executive may not continue the pursuit of better financial performance of the firm, as the shareholders would expect."[506]

All in all, Prospect Theory has provided a foundation for thinking about the effects of stock on executive behavior. Especially when these performance indicators constitute a large amount of executives' wealth, the effects of loss aversion are strongly pronounced, leading to undesirable behavior for the shareholders. In a gain context, a defensive firm strategy (risk reduction) may be employed by the executive to protect his current gains, whilst under a loss context, he may employ an excessively risky firm strategy to recuperate his losses.
To account for these problematic behaviors, it is highly imperative to carefully monitor

[504] See Brunnermeier (2004), p. 99.
[505] See Aaron et al. (2014), pp. 341-342.
[506] Aaron et al. (2014), p. 342.

the amount of company stock in an executive's holdings as it should not be too high relative to his overall to his overall wealth.

5.4 Time Preference Aspects

5.4.1 Hyperbolic Discounting

Classical and neoclassical models, as well as behavioral models, coincide with individuals ceteris paribus preferring rewards sooner than later. However, there is a decisive difference: While classical and neoclassical models assume time consistency, behavioral studies have contradicted this assumption.[507]

The concept of time consistency postulates that choices regarding future events/payouts that maximize the present value of an individual's utility remain optimal independent of the time distance from said choices. To hold true, time consistency requires the incremental rate of time discounting to be constant, independent of when costs and benefits of a choice occur. However, behavioral studies suggest that people have higher discount rates in the near than in the distant future. When having the choice between two alternatives with equal present values, one that leads to gains and losses in the medium term and one with short-term gains but long-term losses, people often favor the second option.[508]

This behavior and several other anomalies in individual time accounting (e.g. preference reversal) have led to behavioral theories regarding choices over time.[509] Ainslie and Haslam developed one such theory under the title of "Hyperbolic Discounting",[510] and this has led to several different extensions over time. In the most basic form, the theory postulates that people have an innate tendency to discount future events steeply in the short term, while their discount factors flatten out in the long run. Hyperbolic discounting, thus, depicts individuals as more patient for more temporally distant rewards than exponential discounting. Therefore, people would be willing to accept an unreasonably lower amount of compensation for forgoing a reward in the present in the case of longer delays.[511]

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[507] See Belifanti (2012), p. 111.
[508] See Laibson (1997), p. 445; Gintis (2000), p. 313; Dasgupta/Maskin (2005), p. 1290; Belifanti (2012), p. 111.
[509] See Pepper/Gore (2015), p. 1054.
[510] See Ainslie/Haslam (1992).
[511] See Streich/Levy (2007), p. 204.

One example of a hyperbolic discount function is what is described as the "generalized hyperbolic discount function" by Loewenstein and Prelec:[512]

$$D(t) = \frac{1}{(1+\alpha t)^{\frac{\gamma}{\alpha}}} \text{ with } \alpha, \gamma > 0$$

α determines "[…] how much the function departs from constant discounting […]"[513] while the time preference parameter γ is positively related to the instantaneous discount rate.[514]

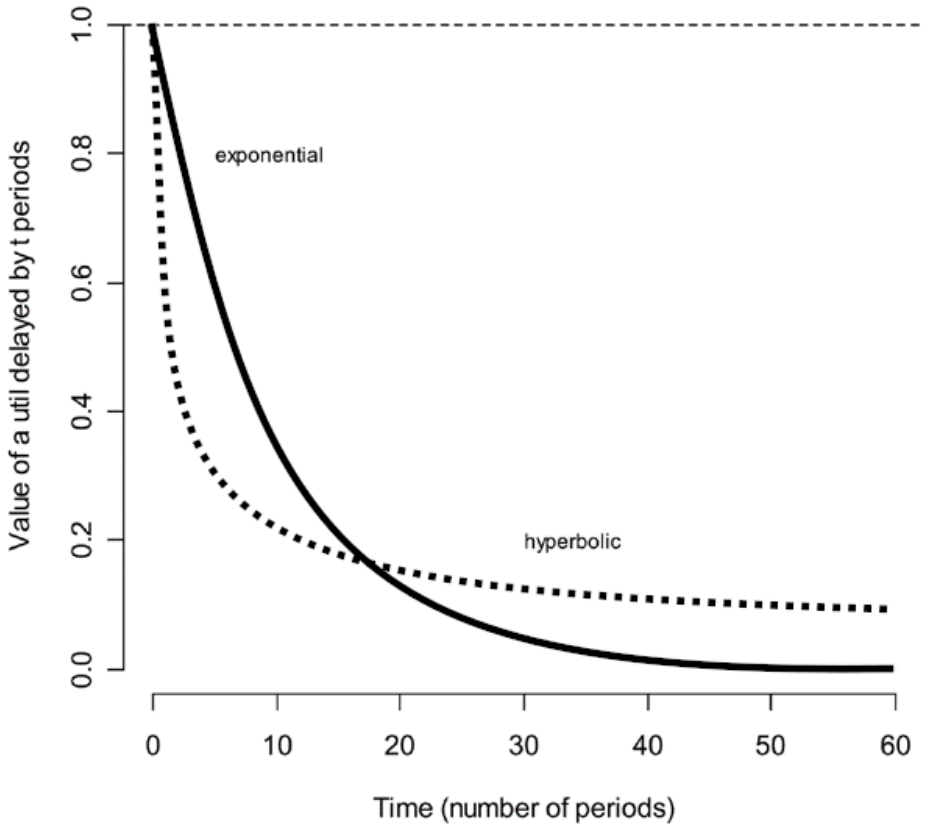

Figure 7: Comparison of Exponential and Hyperbolic Discounting[515]

To see the differences between exponential and hyperbolic discounting, assume an exponential discounting function in the form of

$$D(t) = \delta^t \text{ with } \delta = 0.9$$

and Loewenstein and Prelec's hyperbolic discounting function

[512] See Streich/Levy (2007), p. 209.
[513] Loewenstein/Prelec (1992), p. 580.
[514] See Laibson et al. (1998), p. 100.
[515] Own depiction based on Streich/Levy (2007), p. 210.

$$D(t) = \frac{1}{(1+\alpha t)^{\frac{\gamma}{\alpha}}} \text{ with } \alpha = 2, \gamma = 1$$

As can be inferred from *Figure 7* above, the short-term discounting factor of hyperbolic discounting is lower than that of exponential discounting and falls steeply. For longer delays, this effect reverses as the discounting factor under hyperbolic discounting flattens out much quicker than that of exponential discounting. These two attributes of hyperbolic discounting mirror the behaviors of individuals observed in experimental studies. Therefore, behavioral economists find hyperbolic discounting especially attractive and useful.[516]

If one assumes that hyperbolic discounting as it is described in this section is the "true" way of discounting employed by individuals, the discounting function depicted in *Figure 7* could provide hints on the design of compensation elements. Based on the fact that, compared to exponential discounting, under hyperbolic discounting individuals discount at a higher level in the short term, this would indicate that, to reach the same present value, short-term incentives would have to pay out more than normally assumed under exponential discounting. Additionally, to achieve the same present value of long-term incentives as under exponential discounting, these long-term incentives could be provided at a lower level due to the smaller discount factor. These characteristics of the hyperbolic discounting function could potentially make a case for a higher ratio of long-term incentives compared to short-term incentives as the costs of the long-term incentives would be lower relative to those of their short-term counterparts compared to the case of exponential discounting.

5.4.2 Problems with Hyperbolic Discounting

However, views concerning the actual definition and message of "hyperbolic discounting" among behavioral economists differ greatly.

As seen in the previous section, Streich and Levy sum up hyperbolic discounting by saying that the greater the delay between the present and the point at which the payoff occurs, the lower the discount rate will be. Consequently, the discount factor as well as the relative weight attached to the outcome will be greater, the greater the delay. They argue that the discount function flattens out more than would be the case under the exponential discounting function.[517]

[516] See Streich/Levy (2007), p. 209.
[517] See Streich/Levy (2007), p. 204.

Steel and König's interpretation differs from that of Streich and Levy. According to the former, tasks with short-term rewards that, in classical and neoclassical models, would have lower present value payoffs than alternative tasks with more distant rewards would initially be preferred. However, the more time passes, the likelier the possibility of a preference reversal: As Steel and König postulate, closer to the points of payoff, individuals see the values of the long-term task differently and, if the decision can no longer be changed, they will experience regret for choosing the more immediate gain.[518]

Another different interpretation is that made by Pepper and Gore. They interpret hyperbolic discounting as heavy discounting of future rewards. According to them, this heavy discounting could also lead to the possibility of preference reversals. Consequently, individuals under hyperbolic discounting would discount future compensation with a significantly greater discount rate than financial discounting would predict.[519]

Meanwhile, other authors like Rasmusen claim that hyperbolic discounting only deals with changes in the per-period discount rate over time and discounting in relativistic rather than absolute time. Rasmusen also claims that hyperbolic discounting neither means discounting using a hyperbolic function nor does it portray individuals as being very impatient or having a lack of self-control. Thus, he concludes that one has to be especially careful when thinking about the characteristics and effects of hyperbolic discounting, especially when it comes to drawing conclusions for individuals' behaviors.[520]

Surveying the literature and keeping in mind the properties of hyperbolic discounting functions as they are shown in Section 5.2.3.1, one can conclude that Streich and Levy's interpretation fits the function much better than those made by Steel and König, as well as Pepper and Gore.

However, disagreement not only exists on the properties of hyperbolic discounting but also its consequences for executive compensation. Researchers tend to use hyperbolic discounting to define the optimal time frame regarding compensation elements.
In Streich and Levy's view, hyperbolic discounting depicts individuals as being more patient for more temporally distant rewards than under exponential discounting.

[518] See Steel/König (2006), p. 892.
[519] See Pepper/Gore (2015), pp. 1049, 1055.
[520] See Rasmusen (2008), p. 5.

Therefore, individuals would accept a longer delay combined with an unreasonably lower amount of compensation to forgo a present reward.[521] Belifanti, on the other hand, states that there is an optimal, intermediate time frame in compensation for motivating executives to achieve a reward. She continues by saying that potential rewards beyond this intermediate time frame will only have a very low relative weight attached to them which would be unable to incentivize the executive properly.[522]

However, Frederick, Loewenstein, and O'Donoghue, analyzing several studies, report that the previously described characteristics of hyperbolic discounting only hold true over a relatively short near-term time period. Excluding studies with time horizons less than one year, they found that discount rates no longer declined over time, clustering around an average annual discount factor of 0.8, resulting in a discount rate of 25%.[523] Several other studies have also found managers to be very myopic, setting their discount rates at 31 or 33%.[524]

Overall, it can be concluded that hyperbolic discounting is not applicable for time horizons of more than a year. Therefore, setting executives' incentives based on findings from hyperbolic discounting is not recommended. However, results in this section have shown high discount rates for executives and, thus, myopic behavior. As the discount rates found by researchers are higher than those usually employed in classical and neoclassical theories, boards tend to overestimate the present value of the incentives they set. Consequently, to achieve the desired behavior of executives, the value of long-term incentives would have to be increased substantially to achieve the same present value as under normal discount rate assumptions—which usually revolve around 10 to 15% for managers. Furthermore, the time span between a managerial decision taken and the subsequent rewards being paid out to the manager should be held as short as possible. Due to managerial myopia and the subsequent very high discount rates, monetary rewards would otherwise have to be much greater to achieve the desired effect.

5.4.3 Potential Solutions to Managerial Myopia

At this stage it is important to ask why this myopic behavior of managers is even present. Some authors point to the managers' belief that the stock market will especially value short-term earnings reports. Consequently, managers may have the incentive to

[521] See Streich/Levy (2007), p. 204.
[522] See Belifanti (2012), pp. 113-116.
[523] See Frederick/Loewenstein/O'Donoghue (2002), p. 361.
[524] See Pepper/Gore (2013), pp. 18-20; Pepper (2017), p. 7.

focus especially on short-term projects whilst putting aside research and development or mergers. This is based on the feeling that steady profit rises in a company are valued more by the stock market than long-term projects which may reduce profits in the present but will have a pronounced positive effect in the long run.[525] However, as Merchant and Van der Stede propose, stock markets will also react to long-term decision making by incorporating the long-term impacts of the managers' decisions into the share price.[526] Despite this potential misjudgment from the manager's side, the problem is ever-present. To counteract it, methods need to be incorporated into the compensation system which can help alleviate the myopic pressure that managers subjectively feel.

A possibility is the use of sustainability KPIs[527] or KPIs that are coming from Balanced Scorecards[528] or similar systems that not only cover the financial perspective but also incorporate the customer perspective, an internal perspective, and an innovation perspective[529] within the compensation system. Through the incorporation of these non-financial perspectives the manager's focus may shift away from the short-term profits and will be widened, therefore, reducing his urge to act myopically. However, balanced scorecards must be carefully designed as the additional perspectives will have to be incorporated in such a way that they fit the specific situation of the company and its unique characteristics. Furthermore, the amount of measures needs to be limited. The use of balanced scorecards may tempt their designers to incorporate a cornucopia of performance indicators which will only reduce the simplicity of the compensation system. Moreover, too many performance indicators will also incentivize the manager to focus on only a selection of them and abandon or ignore the rest. Merchant and Van der Stede suggest the use of less than 20 performance indicators within a balanced scorecard.[530] Finally, there is, of course, the question of efficiency surrounding the balanced scorecard. Determining many of the measures of the non-financial perspectives can be very costly and expensive. Furthermore, it is important to operationalize these KPIs so that they can be measured. Ultimately, each company needs to decide whether the incorporation of such a system is financially advantageous for it or not.

[525] See Merchant/Van der Stede (2012), pp. 445-446.
[526] See Merchant/Van der Stede (2012), p. 445.
[527] See Velthuis (2019), p. 184.
[528] For further information regarding the principle of a Balanced Scorecard, see Krause/Arora (2020).
[529] See Merchant/Van der Stede (2012), p. 452.
[530] See Merchant/Van der Stede (2012), p. 454.

5.5 Motivational Aspects

5.5.1 Introduction

Devising a compensation plan for executives cannot take place without a discussion on motivation. Motivation is an important aspect with which to steer executives towards the desired behavior and can also help in designing tailor-made compensation plans. The topic is a vast in behavioral economics, and is one that holds a good number of different concepts and theories. This section presents a selection of these concepts and the consequences each one of them has on the design of executive compensation.

5.5.2 The Conflict between Intrinsic and Extrinsic Motivation

5.5.3 The Basics of Intrinsic and Extrinsic Motivation

Classical and neoclassical economic theories normally do not distinguish between different types and sources of motivation, as from their perspective all motivational elements stem from an individual's underlying preferences.[531]

In behavioral economics, however, a distinction between extrinsic and intrinsic motivation is made. Extrinsic motivation is defined as motivation coming from external need satisfaction through rewards, e.g. in the form of money.[532] These rewards are subsequently employed to satisfy one's non-work-related needs.[533]

The definition of intrinsic motivation is more complex. First off, intrinsic motives formed by a person are emphasized by psychologists.[534] A well-known formulation of intrinsic motivation goes back to Deci,[535] where "[o]ne is said to be intrinsically motivated to perform an activity when he receives no apparent rewards except the activity itself."[536] Through these activities, individuals will feel competent and self-determining.[537] Intrinsic motivation, thus, depicts an individual's willingness to engage in activities to learn, develop, and expand his capabilities. The individual expects no external reward and acts solely for the satisfaction received from the activity itself.[538]

However, there are many more different definitions of intrinsic motivation. Most problematic, as Rheinberg and Engeser point out, is the fact that the terminology of "intrinsic motivation" is often used for different and distinct matters. Therefore, there is no

[531] See Frey/Jegen (2001), p. 591.
[532] See Frey (1997), pp. 13-14.
[533] See Frey/Osterloh (2002), p. 8.
[534] See Frey/Jegen (2001), p. 591; Steiner/Landes (2017), p. 125.
[535] See Deci (1971), p. 105.
[536] Deci (1971), p. 105.
[537] See Deci (1975), p. 61.
[538] See Ryan/Deci (2000), p. 16.

universal concept of intrinsic motivation and no unanimity concerning its functions and ramifications.[539]

For a concise overview of this matter, Heckhausen identified several different concepts of intrinsic motivation:[540] The first definition goes back to Koch. According to his definition, intrinsic motivation can be defined as an *internal drive without aiming at drive reduction*. Under this concept, the idea of intrinsic motivation can be distinguished from other drives such as hunger, thirst, or pain avoidance—concepts under which an individual acts to reduce the drive that urges him to act.[541] Internal motivation can also be defined differently, using it for all *activities that are an end in themselves*. Examples would be activities done for pure enjoyment, like leisure-time activities.[542] The third definition goes back to the works of Hebb, Helson, and Berlyne, who all define it as the *upkeep of certain elements' optimal levels* (e.g. for arousal).[543] Finally, there is Deci's well-known definition of *activities being performed on a self-determined basis without the expectation of an external reward*.[544]

In sum, the various concepts of intrinsic motivation are all based on different ideas. Kunz and Pfaff, however, name three common principles that they find in all definitions: The first is the element of *internal motivation*, stemming from drives within a person without any external incentives. Second, they argue that all concepts of intrinsic motivation define it as *lacking instrumentality*. Consequently, internally motivated activities have no connection between behavioral results and desired outcomes. Finally, according to Kunz and Pfaff, all concepts of intrinsic motivation incorporate *attached feelings*. Thus, performing intrinsically motivated activities would lead individuals to experience enjoyment and satisfaction.[545]

Rheinberg and Engeser dispute this finding, however, concluding that the concepts cannot be merged as, from their perspective, they have no common ground. Therefore, they argue that the search for the "true" concept of intrinsic motivation at the current state of literature is impossible.[546] Adding to Rheinberg and Engeser's argument, Frey and Jegen remark that, consequently, separating intrinsic and extrinsic elements in an

539 See Rheinberg/Engeser (2018), p. 425.
540 See Heckhausen (1989), pp. 455-460.
541 See Koch (1956), pp. 81-82.
542 See Heckhausen (1989), p. 456.
543 See Hebb (1955), p. 244; Heckhausen (1989), p. 456.
544 See Deci (1971), p. 105.
545 See Kunz/Pfaff (2002), p. 280.
546 See Rheinberg/Engeser (2018), p. 430.

individual's motivation to perform an activity can be highly complex if not, in certain cases, impossible.[547]

As the many definitions of intrinsic motivation are difficult to combine, the focus will henceforth center on Deci's definition of intrinsic motivation, which is widely known and broadly accepted and used.

5.5.4 The Undermining Effect

Even though behavioral economists distinguished between extrinsic and intrinsic motivation as early as the mid-20th century, both motivational concepts were often seen as independent of one another. However, several researchers were already of the opinion that intrinsic and extrinsic motivation interacted with each other.[548] Later empirical research on both concepts showed that this was indeed the case,[549] leading to further discussions about the interaction between intrinsic and extrinsic motivation.

Some studies argue that extrinsic rewards could enhance intrinsic motivation.[550] Others, including meta-analyses by Cameron and Pierce and Deci, Koestner, and Ryan, claim the opposite, hinting at a trade-off between both types of motivation.[551] The more complex a task or problem an individual faces, the more pronounced the trade-off will be according to proponents of this theory.[552] Lepper and Green named this often overlooked trade-off "The Hidden Cost of Reward",[553] whilst Deci, Koestner, and Ryan, proponents of the trade-off theory, coined the decrease of intrinsic motivation due to extrinsic rewards the "undermining effect".[554] Supporters of the trade-off hypothesis postulate that under certain conditions, external rewards (e.g. money) could undermine or even corrupt motivation. Deci developed three propositions concerning the effects of extrinsic rewards on intrinsic motivation:

First of all, Deci argues that introducing external rewards into purely intrinsically motivated behavior could shift an individual's reason for pursuing said behavior from an intrinsic to an extrinsic one. Here, the individual would no longer pursue the activity out of interest but rather for the reward he would consequently receive. This would, as

547 See Frey/Jegen (2001), p. 591.
548 See Deci (1971), p. 114; Lepper/Greene/Nisbett (1973), p. 130.
549 See Harter/Jackson (1992), p. 221; Rigby et al. (1992), pp. 168-169; Tang/Hall (1995); Deci/Koestner/Ryan (1999).
550 See Ryan (1982); Ryan/Mims/Koestner (1983).
551 See Cameron/Pierce (1994), Deci/Koestner/Ryan (1999).
552 See Frey/Osterloh (2002), p. 14.
553 See Lepper/Greene (1978).
554 See Deci/Koestner/Ryan (2001), p. 1.

other authors also argue, result in diminishing intrinsic motivation.[555]

Second, according to Deci, introducing external rewards could undermine the principle of self-determination—the act of pursuing an activity on one's own volition. The level of intrinsic motivation hinges on the attribution of the activity's results on either internal or external factors. If it is perceived as a consequence of one's self-determined actions, intrinsic motivation will be higher than when the result is seen as a consequence of guided behavior through external factors. Consequently, the introduction of external rewards could lead to the questioning of the self-determination principle and even go as far as to curtail an individual's belief in his competences. The consequence, again, would be a reduction of intrinsic motivation.[556]

Finally, in his third proposition, Deci relativizes the effects of external rewards, separating them into two categories: controlling and informational rewards. According to him, controlling rewards could diminish intrinsic motivation, whilst informational ones could enhance it. He attributes these two diverging effects to the rewards' ramifications on self-determination and the feeling of competence: Rewards are usually tied to the achievement of a certain goal or a certain behavior and, therefore, are supposed to guide the recipient towards the desired behavior. This restriction leads to the feeling of decreased self-determination and, thus, a reduction in intrinsic motivation, as the possible actions to choose from are limited by the controlling aspect of a reward. If a reward, on the other hand, is designed to give an individual information about his performance, it can enhance the feelings of competence by providing him with a measure to judge his achievements.[557]

This "undermining effect" is an important finding of behavioral economics. It constitutes the antithesis to classical and neoclassical models' theory of increasing external (i.e. monetary) incentives to increase a recipient's effort.[558] Given the undermining effect, raising monetary incentives could lead to a reduction in the recipient's overall motivation and subsequently reduce his effort. As Frey and Jegen conclude, extrinsic motivation undermining intrinsic motivation provides a major anomaly "[…] because it predicts the reverse reaction to the one expected according to the relative price effect, on which much of economics is based."[559]

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555 See Deci (1971), p. 114; Deci (1975), pp. 139-142; Bénabou/Tirole (2003), p. 503.
556 See Deci (1975), pp. 139-142.
557 See Deci (1975), pp. 139-142; Ryan/Deci (2000), pp. 17, 20, 27, 31; Frey/Osterloh (2002), p. 14; Ims/Pedersen/Zsolnai (2014), p. 355.
558 See Frey/Jegen (2001), pp. 590-591.
559 Frey/Jegen (2001), p. 591.

Based on the findings and arguments listed in this section, extrinsic incentives need to be carefully designed to prevent them from undermining intrinsic motivation. In particular, Frey and Osterloh underline that the introduction of a bonus system, if not constructed carefully, could lead executives to lose interest in the immediate objectives of their jobs and, in turn, encourage them to focus solely upon whatever it is they are measured.[560] Optimally, bonuses should not be overly high-powered and perceived as more informing than controlling. However, there is an incredibly fine line between whether a reward is perceived as controlling or informing. One possibility to emphasize the informing aspect is discussed in the next section, which deals with Goal Setting Theory.

5.5.5 Goal Setting in Incentive Systems

5.5.5.1 Goal Setting Theory

One method of emphasizing the informing aspect of external incentives is the setting of goals as proposed by Goal Setting Theory. This theory was decisively formed by Locke and Latham and serves the purpose of depicting the influence of performance targets on goal attainment.[561] The foundation of Goal Setting Theory is provided by several empirical studies conducted by Locke and Latham to examine a performance target's influence on an individual's effort.[562]

In principle, Goal Setting Theory asserts that an individual's effort towards a task is governed by conscious goals.[563] As Bonner and Sprinkle make clear, "[…] personal goals are the stimulant of the incentive-induced effort increases […]."[564]
The theory's core premise is that goals and especially the way they guide actions are an essential aspect of human life. As Locke and Latham propose, there exists a linear relationship between the difficulty of a goal set and the subsequent performance of the individual faced with said goal.[565]

The next question that arises is how exactly a goal is defined. A goal refers to the level of performance an individual wishes to attain within a certain time frame. As Locke and Latham put it, it is "[…] first and foremost a discrepancy-creating process, in that

[560] See Frey/Osterloh (2002), p. 14; Frey/Osterloh (2005), p. 106.
[561] See Locke/Latham (2002), p. 705.
[562] See Locke/Latham (2006), p. 265.
[563] See Locke/Latham (1990), p. 4.
[564] Bonner/Sprinkle (2002), p. 308.
[565] See Locke/Latham (2006), p. 332.

the goal creates constructive discontent with our present performance."[566] Consequently, an individual will expend effort to reach the performance level and will not settle for anything less.[567] Setting a certain performance level as a goal, in other words, leads the individual to strive for it by attempting to bring his current performance in line with the goal. Here, especially challenging goals will lead to greater performance.

In their papers, Locke and Latham identified four mechanisms through which this behavior is promoted:

The first effect challenging goals have on individuals is an *energizing function*. A challenging goal will be harder to achieve than an easy one. Individuals will, therefore, expend more effort on a challenging goal.[568]

Second, challenging goals will not only be energizing but also *affect arousal*. As Wood and Locke argue, challenging goals will promote arousal through the use of task-relevant knowledge and strategies,[569] which will consequently enhance the intrinsic desire to prove one's competence. Compared to easy goals, challenging goals will, therefore, lead to higher levels of arousal and, thus, cause an individual to expend higher levels of effort.[570]

Third, challenging goals will also affect the effort's *persistence*. Not only will the effort spent be higher, it will also be expended over a longer period. In their study on the effects of goals on learning, LaPorte and Nath ascertained that people would willingly allocate more time towards achieving a challenging goal than they would for an easy one.[571]

Fourth, goals have a *directive* function on both the cognitive and the behavioral level. They will direct an individual's attention towards goal-relevant activities by inducing him to spend time and energy to achieve the goal while ignoring irrelevant activities and distractions. This effect occurs both cognitively and behaviorally.[572]

Consequently, a goal serves as a yardstick to evaluate one's performance. If individuals reach or even exceed the performance stated within a goal, they experience success and their perception of competence is reinforced. Above all, challenging goals will

[566] Latham/Locke (2006), p. 332.
[567] See Locke/Latham (1990), p. 95.
[568] See Locke/Latham (1990), pp. 86, 94-95; Locke/Latham (2002), pp. 706-707.
[569] See Wood/Locke (1990), pp. 95-96.
[570] See Locke/Latham (1990), pp. 86, 94-95; Locke/Latham (2002), pp. 706-707.
[571] See LaPorte/Nath (1976), p. 263; Locke/Latham (1990), pp. 86, 94-95; Locke/Latham (2002), pp. 706-707.
[572] See Locke/Latham (1990), pp. 86, 94-95; Locke/Latham (2002), pp. 706-707.

have the most sizeable effect on individuals' efforts. They will not only lead to greater feelings of competence and success but in all likelihood also provide additional rewards such as recognition or higher monetary rewards. Subsequently, especially the fulfillment of goals seen as challenging or hard to achieve will lead to high levels of pleasure and satisfaction.[573] Therefore, it can be said that goals and especially challenging ones will help emphasize the informing aspects of an incentive and can thus serve to increase intrinsic motivation while providing additional extrinsic motivation when combined with monetary rewards.

However, setting challenging goals comes with one particularly important caveat: If an individual is unable to attain the given performance level, his feeling of competence will be weakened and he will feel dissatisfied, potentially reducing intrinsic motivation.[574] Therefore, goals should be challenging but not impossible or, perceived to be impossible to attain.

The goal set should have two main characteristics:

First, instead of a vague "Do your best", the goal should be well-defined, e.g. "Increase net profits by 5%." Additionally, a time constraint within which the goal is to be achieved should be set. Thus, the goal formulation will emphasize the informing aspect and give the recipient a precise yardstick for comparing his performance and effort.[575]

Second, the goal should be challenging but not unattainable. As seen previously in this section, challenging goals will improve performance by energizing the recipient and leading him to persist in his effort to reach the goal. Additionally, a challenging goal will also improve intrinsic motivation by allowing the recipient to prove his competence. However, if goals are overly challenging, the opposite will occur. Therefore, setting goal requirements carefully is of the utmost importance. As Locke and Latham suggest, this should be done on an individual level, as individuals with low self-confidence or ability should be given easier goals than their more confident and capable counterparts.[576] *Figure 8* below shows the relationship between a goal's difficulty and the motivational effect it will have. It can be seen that the highest motivation is achieved at a challenging but more intermediate level of difficulty. Findings from certain studies suggest that the probability of achieving a goal should be around 40%, however others advocate something closer to 80 or 90%. For example, Merchant and

[573] See Latham/Locke (2006), p. 333.
[574] See Latham/Locke (2006), p. 333.
[575] See Latham/Locke (1979), p. 77; Locke/Latham (1990), pp. 28-29; Latham/Locke (2006), p. 332.
[576] See Latham/Locke (1979), p. 77.

Van der Stede suggest an achievability of 80 to 90%, saying that these probabilities resemble the chances of an effective management team employing high effort levels to achieve the goal. Therefore, management teams will only have these probabilities if they employ high levels of effort. Consequently, defining goals with an achievability of 80 to 90% will have the highest motivational effect.[577]

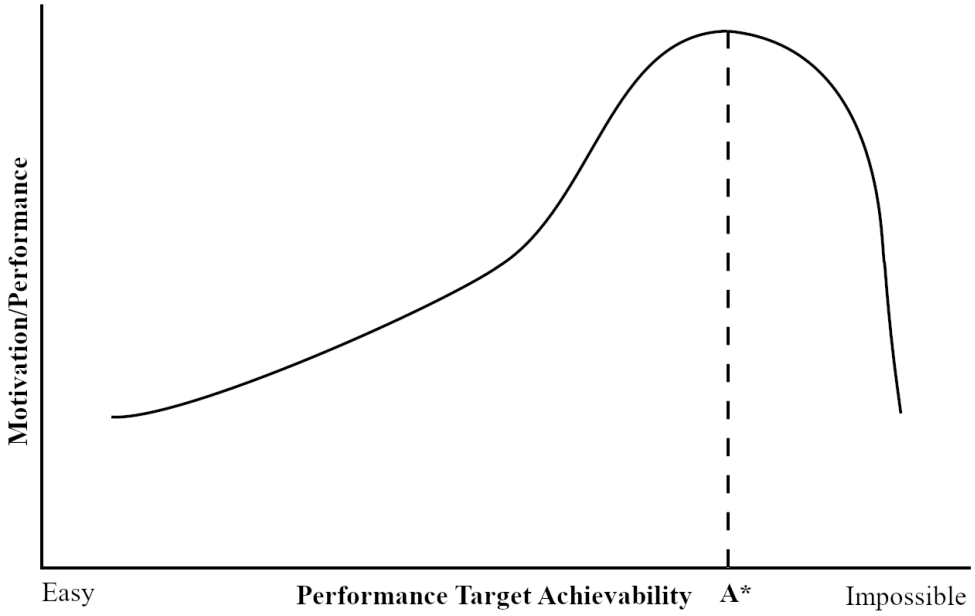

Figure 8: The Relationship between Goal Difficulty and Motivation[578]

When setting a challenging goal in combination with monetary incentives, it is imperative that the recipient is paid not only once he has achieved the set goal. Instead, recipients should also be paid for their performance.[579] Otherwise, ascertaining that the goal can no longer be attained and subsequently realizing that no payment will be forthcoming would demotivate the recipient, leading him to slack off as his self-efficacy declines.[580]

Another element that should be heeded when setting challenging goals is the overall market development and its consequences for the achievability of goals. A good managerial performance within a market that is declining (which was not anticipated when the goal was set) can lead to the manager not reaching the goal and, thus, have a demotivating effect. One way of rectifying this problem would be the employment of flexible goals. These goals could be made dependent on the overall market

577 See Merchant/Van der Stede (2012), p. 314.
578 Own Depiction based on Merchant (1998), p. 388.
579 See Lee/Locke/Phan (1997), pp. 557-558.
580 See Latham/Kinne (1974), p. 190.

performance or that of close competitors so that the manager and his performance will be measured according to the current circumstances and environment.[581] In this case, a good performance within a harsh market would still allow the manager to achieve his goal whilst a bad performance within a booming market would not be wrongfully rewarded.

Additionally, goals should be accompanied by external feedback to strengthen their informing aspect. This form of feedback would add an additional layer of information regarding the recipient's current performance and whether he needs to improve his effort.[582]

There remains the question of how goals should be set. Goals/performance targets can be determined in different ways. The first is to derive a goal from a quantitative model which makes predictions of possible performances in the future. These types of goals are best used in areas with a direct and relatively stable connection between inputs and outputs.[583] Second, goal setting can be based on historical targets, namely the results from the previous periods raised by a certain increase in performance that is expected from the manager.[584] In the managerial realm, however, targets are usually negotiated either between managers and their superiors or between the top management and the board. These negotiations have the advantage that they are not limited by the complexity of managerial tasks as is the case with the other two methods. Moreover, as information asymmetry is prevalent in the managerial realm, negotiations can allow for the sharing of some of the informational advantages that the single parties have.[585]

For a complete picture of goal setting, it is also important to look at its moderators: feedback, task complexity, and goal commitment.

Deshon and Landis define *goal commitment* as "[…] the degree to which the individual considers the goal to be important, is determined to reach it by expending effort over time, and is unwilling to abandon or lower the goal when confronted with setbacks and negative feedback."[586] Consequently, goals are especially effective when the targeted individual has a high goal commitment.[587] However, without goal commitment, goals can neither lead to greater effort nor be effective. That is to say, a person that has an

[581] See Merchant/Van der Stede (2012), pp. 311-312.
[582] See Locke/Latham (2002), p. 708.
[583] See Merchant/Van der Stede (2012), p. 310.
[584] See Merchant/Van der Stede (2012), p. 310.
[585] See Merchant/Van der Stede (2012), p. 311.
[586] Deshon/Landis (1997), p. 106.
[587] See Frank (2012), p. 36.

assigned goal but is not committed to it will not expend much effort to reach it.[588]
The degree of goal commitment depends on the perceived importance of a goal and the so-called self-efficacy.[589] Self-efficacy describes the evaluation of an individual's capabilities to perform a certain task or expend a certain level of effort.[590] Therefore, the more important a goal is perceived as being and the higher the individual's belief that he can achieve it, the higher the goal commitment. Thus, it is important to balance the scales of goal difficulty and goal reachability. An easy goal will be accompanied by a high self-efficacy but will be deemed much less important than a challenging one. Setting goals to challenging but attainable levels is thus the way to achieve the best level of goal commitment.
The second moderator of goal setting is *feedback*, another important factor for the effectiveness of goals and also important when striving to construct goals that are seen as informing rather than controlling. Feedback gives an individual information about his current progress towards a goal and his current performance level. Should the information received lead to the conclusion that the current effort level is deficient and would threaten the goal achievement, the individual could adjust his effort based on said information.[591]
Finally, *task complexity* is the third moderator of goal setting. The higher the complexity of a goal, the more important the individual's capabilities. A very complex goal leads to a reduction in perceived importance, as the importance of finding the proper approach to achieve the goal is now in the foreground.[592] This can lead to increased intrinsic motivation as individuals want to prove their competence, however, at the same time it may also lead to resignation, as no proper approach to a goal can be found.

Overall, Goal Setting Theory seems to make a compelling case for incorporating goals into incentive systems, especially since Locke and Latham built their theory based on empirical findings. However, the transferability of these findings (won in the laboratory) to organizations in the real world has been questioned by a number of scholars. For example, Bonner et al. criticize the fact that Locke and Latham's studies are mainly based on simple activities like wood cutting. Keeping in mind that complexity is an important moderator of a goal's efficiency this raises the question of whether the

[588] See Locke/Latham (1990), p. 124.
[589] See Locke/Latham (2002), pp. 707-708.
[590] See Bandura (1997), p. 21.
[591] See Frank (2012), p. 37.
[592] See Locke/Latham (2002), pp. 708-709.

findings gleaned from these studies can be compared to complex tasks on the management level.[593] Yearta, Maitlis, and Briner second this opinion, stating that activities used for researching goal setting are often one-dimensional and only employed over a very limited time period. This can severely limit the validity of the results regarding long-term relationships, which are more common on the management level of organizations.[594] Additionally, studies taking place in a laboratory will not be able to capture complex social interactions like that of a supervisor and his employee and the overall structures in organizations, yet again potentially limiting the validity of Goal Setting Theory for more complex tasks in the real world.[595] To conclude, Goal Setting Theory's validity has been called into question mainly for the lack of evidence as concerns more complex tasks outside of the laboratory. Therefore, if the empirical validity of Locke and Latham's theory is to be proved, it is clear that further empirical studies with more realistic settings are required. However, despite some criticism regarding its empirical validity in more complex situations, goal setting can still be said to provide a valuable contribution to the design of incentive systems.

To sum up, introducing goals into incentive schemes leads recipients to be more motivated as they strive for the goal set. Goals should be challenging but still attainable with a recommended probability of 80 to 90%. These goal requirements can be achieved by setting a bonus function similar to that presented in Section 3.5, namely a bonus function equipped with a challenging target and an incentive zone around the target. Recipients would work towards achieving the goal set but would be paid not only for reaching it but also for their performance around the target in a piece-rate scheme. Setting the targets could be done on an individual or a team basis. Team targets are especially useful if there is a conflict within a group and individual targets would lead to competition amongst the group's members. Competition could consequently lead to the withholding of information and ideas from one another—behavior that is clearly not in the interest of shareholders.[596]

5.5.5.2 Optimism Bias in Goal Setting

In the previous section, it was shown that setting challenging goals in an incentive system leads the recipient to expend more effort towards achieving it and, thus, will lead him to act in ways that benefit the organization and its shareholders. However,

[593] See Bonner et al. (2000), p. 24.
[594] See Yearta/Maitlis/Briner (1995), p. 245.
[595] See Eichenberger (1992), p. 41.
[596] See Latham/Locke (2006), p. 334; Locke/Latham (2006), p. 266.

the goal-setting process needs to be carefully examined as human tendencies can cause goals to be set at levels too challenging for the executive, which may subsequently diminish, rather than improve performance.

This bias innate to humans regarding goal setting is the so-called "Optimism Bias". "Optimism" is the tendency to generally overweigh the probability of good events and underweigh that of bad ones. Individuals usually expect things to go their way.[597] "Optimism Bias" then is the difference between an individual's high expectations for the future and the subsequent lower outcomes.[598] According to Sharot, optimism bias "[…] is one of the most consistent, prevalent, and robust biases documented in psychology and behavioral economics."[599] For example, in their study concerning optimism in decision-making, Berndsen and Van der Pligt found evidence for the optimism bias.[600] Importantly, they also found that optimism affected gains and losses differently. While individuals tend to believe that losses are avoidable, they are overly optimistic about gains, even expecting that one gain is followed by another.[601]

Regarding the realm of executive compensation and incentive contracts, optimism bias makes an important contribution: The occurrence of optimism bias could lead both management and the board to agree on goals that are unrealistic/unreachable when setting a new incentive structure. Both would overweigh the possibility of gains and underestimate potential risks and losses that could make the goal impossible to attain and thus prove too challenging. Consequently, as seen in the previous section, the agreed-upon impossible goal could demotivate the recipient once the optimism effect subsides. A reduction in performance and, therefore, a worse organizational outcome would not be in the interest of the shareholders.

Further studies on the effect of optimism bias in the realm of compensation systems are still needed to improve the understanding of how boards and management can succumb to this effect, allowing policymakers better chances to influence the setting of goals. However, there is one conclusion that can already be drawn: The setting of performance goals/targets should always be carefully monitored and scrutinized, preferably by a source that was less involved in the goal-setting process. This can severely reduce the risk of setting overly high-performance targets and the recipients becoming

597 See Hey (1984), p. 182; Scheier/Carver (1985), p. 219.
598 See Sharot et al. (2007), p. 102; Sharot (2011), p. R941.
599 Sharot (2011), p. R941.
600 See Berndsen/Van der Pligt (2001), pp. 174-175, 185.
601 See Berndsen/Van der Pligt (2001), pp. 173, 175.

demotivated and, as a result, slacking off. One possibility would be the employment of so-called "compensation consultants" who were not involved in the setting of targets by the board and the executive. However, as the setting of targets requires a deep knowledge of the company and indeed much further information (e.g. highly detailed knowledge of the market in which it operates or its competition status or intricate, specific company details), consultants may not have enough information or knowledge to properly monitor the setting of targets. Therefore, an internal source that was not party to the process of target setting would be preferable.

5.5.5.3 The Sequencing Effect in Goal Setting

One further human tendency that can be combined with the setting of goals/targets and overall the setting of incentive systems is the so-called "Sequencing Effect". This effect comes to fruition if a decision-maker views his goals or outcomes as part of a sequence and not as single, isolated events. Normally, as research on intertemporal choice has shown[602] and Section 5.2.3 corroborated, decision-makers tend to be myopic. They prefer rewards sooner rather than later and, due to their high discounting rate, will often opt for a lower reward that is more easily in reach than a large reward in the distant future. Contrary to this, decision-makers will behave differently if they perceive several outcomes as part of a sequence.

This idea is captured by the sequencing effect which states that if, ceteris paribus, a decision-maker perceives outcomes as part of a sequence, he prefers these outcomes to improve over time. Instead of the positive time preferences of intertemporal choice, decision-makers would experience so-called negative time preferences in the form of improving outcomes over time.[603] To explain this phenomenon, authors cite numerous different factors, namely savoring and dread, adaptation, and loss aversion in conjunction with reference point shifts. For example, improving outcomes over time would allow individuals to savor the best outcome for last while dealing with losses/the weakest outcomes first would remove the dread of outcome deterioration.[604]

Meanwhile, citing the argument of loss aversion and reference-point shifts, Loewenstein and Prelec predict that decision-makers would always compare their outcome this period to their reference point (the outcome in the previous period) when perceiving a set of outcomes as a series. They argue that through this mechanism, decision-makers would adapt to the most recent level of stimuli/rewards. This would shift their

602 See Thaler (1981); Chapman/Elstein (1995); Chapman (1996).
603 See Loewenstein/Prelec (1993), p. 91; Chapman (2000), p. 203.
604 See Kahneman/Tversky (1979), pp. 286-288; Loewenstein/Prelec (1993), p. 92.

reference point to said level and consequently, a drop in outcome/performance would lead to a perceived loss. On the other hand, an improving sequence of outcomes would be perceived as a continuous series of gains and, therefore, would be preferred as losses weigh heavier than equal gains (see Section 5.3.2).[605]

Overall, the more several targets spread over time are seen as a sequence, the higher the decision-maker's predilection to improve his performance and, therefore, his rewards over time. Whether the decision-maker does indeed perceive targets as part of a sequence or not depends on several factors, e.g. the framing of his choices, the perceived connection/similarity between targets, and the delay between outcomes.[606]

Studies like that of Loewenstein and Sicherman's lend support to the idea of the sequencing effect: In examining wage profiles, they found that workers preferred an improving sequence of wages even if a wage profile with a better NPV but declining wages over time was offered as an alternative.[607]

In sum, then, it would be useful to incorporate the sequencing effect into incentive systems/compensation design. If the targets within an incentive system can be designed to be perceived as a part of a sequence, the decision-maker's desire to improve his performance would benefit the organization. To achieve this, annual performance benchmarks should be framed as part of a larger plan and could be connected through a final (e.g. five-year) benchmark.

5.5.6 Temporal Motivation Theory

One behavioral theory that combines several aspects introduced in the previous chapters is the Temporal Motivation Theory developed by Steel and König. It combines aspects of hyperbolic discounting, expectancy theory, prospect theory, and need theory to investigate the best possibilities for setting goals in incentive systems. This section offers an overview of the single elements that Steel and König utilized to deduce their final formula from. This is done so as to obtain a better understanding of the main idea behind temporal motivation theory and the subsequent interpretations that follow from the final formula.

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[605] See Loewenstein/Sicherman (1991), pp. 70-71; Loewenstein/Prelec (1993), pp. 70, 71, 92; Kahneman/Tversky (2003), p. 33.

[606] See Belifanti (2012), p. 120.

[607] See Loewenstein/Sicherman (1991), pp. 80-81.

First off, Steel and König base their theory on the matching law, an element of hyperbolic discounting (which has been described in Section 5.4). They use the simplest version, namely:[608]

$$Utility = \frac{Rate \cdot Amount}{Delay}$$

with *Rate* describing the frequency of an action leading to a reward, *Amount* the level of the reward received and *Delay* the time between an action taken and the payout received. The sooner a goal is rewarded, the higher the motivation will be.[609] *Delay* is then transformed by Steel and König through the use of the expression $Z + \Gamma(T - t)$ for hyperbolic discounting to come up with the following formula:[610]

$$Utility = \frac{Rate \cdot Amount}{Z + \Gamma(T - t)}$$

with $T - t$ describing the delay in time between action and reward, Γ being a measure of an individual's sensitivity to delays,[611] and Z being a constant. Monterosso and Ainslie, as well as other authors, argue that Γ mirrors impulsiveness.[612]
From this equation, one can see that the greater the delay in the reward's payout and the higher the sensitivity of an individual to that delay, the lower the utility for this payout will be. This fits in well with the findings of Section 5.4 and also the basic requirement of *timeliness* described in Section 3.6. As seen in Section 5.2.4, hyperbolic discounting cannot be applied to predict long-term discounting rates for periods longer than a year but it makes an important contribution here. Hyperbolic Discounting states that the closer an event is to the present, the more important it becomes. This by itself can already be interpreted as a contribution towards the design of a compensation system as it suggests that goals that are closer together can have a higher motivational effect than those with a larger time difference between them.

Moving on, Steel and König introduce expectancy theory into their theory, which states that decision-making is based on the evaluation of an outcome regarding its probability of occurring/being achieved (expectancy) and the subsequent expected value it provides.[613] Naturally, one would expect the option with the best expected

608 See Steel/König (2006), p. 892.
609 See Steel (2007), p. 71; Gröpel/Steel (2008), p. 407; Steel et al. (2018), p. 2.
610 See Steel/König (2006), pp. 892-893.
611 See Steel/König (2006), p. 893; Steel (2007), p. 71.
612 See Monterosso/Ainslie (1999), pp. 341-342; Petry (2001), pp. 484-485.
613 See Steel/König (2006), p. 893.

value to be chosen. However, as bounded rationality suggests (see Section 5.2), individuals tend to use satisficing strategies as a heuristic to cope with the overload of information they receive. Therefore, it should be kept in mind that most likely a satisficing strategy will be chosen, namely, the first evaluated outcome which passes a certain threshold previously set by the individual.

The combination of Expectancy and Value is very similar to hyperbolic theory's *Amount* and *Rate*, so that Steel and König replace the latter with the former:[614]

$$Utility = \frac{Expectancy \cdot Value}{Z + \Gamma(T - t)}$$

By introducing Expectancy Theory, according to Steel and König the formula makes a shift towards two individually perceived elements. *Value* incorporates the subjective evaluation of an outcome's level of reward and is influenced by an individual's task aversiveness (the more unpleasant a task, the lower the motivation of the individual) and his need for achievement.[615] *Expectancy* weighs the probability of an outcome differently for each individual (similar to the Probability Weighting Function of Prospect Theory; see Section 5.3.3).[616] This formula already shows the tradeoff that comes with goal setting: On the one hand, goals that are difficult but lead to a higher payoff also provide the decision-maker with higher utility. On the other, more difficult goals will have lower expectancies, consequently reducing the utility for pursuing the goal. This shows that setting goals within compensation systems needs to be done accounting not only for the difficulty of a goal but also the probability of achieving it, as discussed in Section 5.5.5.

Steel and König then incorporate Prospect Theory into Temporal Motivation Theory. As stated in the previous paragraph, expectancy can also be expressed by the Probability Weighting Function of Prospect Theory. Here, the Probability Weighting Function of Cumulative Prospect Theory (the later extension of the original Prospect Theory) is used by Steel and König to modify the formula. Furthermore, they incorporate the concept of press into their equation, an element of Need Theory that they use for distinguishing Γ for gains and losses:[617]

[614] See Steel/König (2006), p. 894; Steel (2007), p. 71; Gröpel/Steel (2008), p. 407; Steel et al. (2018), p. 2.
[615] See Steel (2007), p. 72.
[616] See Steel/König (2006), p. 894.
[617] See Steel/König (2006), pp. 895-896.

$$Utility = \sum_{i=1}^{j} \frac{E_{CPT}^{+} \cdot V_{CPT}^{+}}{Z + \Gamma^{+}(T-t)} + \sum_{i=j+1}^{n} \frac{E_{CPT}^{-} \cdot V_{CPT}^{-}}{Z + \Gamma^{-}(T-t)}$$

The Probability Weighting Function of Cumulative Prospect Theory distinguishes between weighting for gains and losses and, contrary to the original model, incorporates n possible outcomes.[618] E_{CPT}^{+} and V_{CPT}^{+} stand for the (individually weighted) expectancy and value of gains, while E_{CPT}^{-} and V_{CPT}^{-} do the same for losses. Utility is consequently the sum of the individually perceived positive expected utility for j gains and the negative one for $n - j$ losses.

In sum, Temporal Motivation Theory combines Hyperbolic Discounting, Expectancy Theory, Prospect Theory, and Need Theory to come up with four elements that provide a better understanding of how goals should be set optimally: Value, expectation, the temporal component, and different perceptions of gains and losses.
An outcome's *value* measures the attractiveness of an outcome/its contribution to drive reduction, which may differ between individuals based on their current needs and the situation in which they find themselves. *Expectation* meanwhile deals with the perceived probability/attached weight to an outcome which is, once again, individually different. As pointed out in Section 5.3.3, it is a combination of the probability of an outcome combined with a subjective component that transforms the probability into a decision weight. Furthermore, the *temporal component* predicts that an event's influence and importance will depend on its timely distance to the current point in time. The closer it is to today, the more influence it will have on an individual's decision. Lastly, as proposed by Kahneman and Tversky in Prospect Theory, *losses and gains* are evaluated differently, resulting in different consequences for an individual's utility.

The combination of elements from Hyperbolic Discounting, Prospect Theory and Expectancy Theory allows Temporal Motivation Theory to make a valuable contribution to the setting of incentive systems, especially in conjunction with Goal Setting Theory and the Sequencing Effect. *Figure 9* shows the utility/motivation of a decision-maker under an incentive contract with no goal/one large goal at the end and one with several goals set in between the starting point and the final payout. As can be seen, setting several goals spread over time leads to higher motivation and thus induces the decision-maker to expend greater effort towards the task behind the goals.

[618] The Probability Weighting Function of the original Prospect Theory only accounts for two different outcomes.

Dividing a large goal into several sub goals, therefore, takes advantage of an important element of Temporal Motivation Theory: the proximity to a goal. As the sub goals are closer to the current point in time, their importance for the decision-maker is higher than would be the case for one big, final goal.[619] Additionally, if the decision-maker perceives the sub goals as part of a sequence, his motivation to improve over time would furthermore increase his effort towards the task at hand.

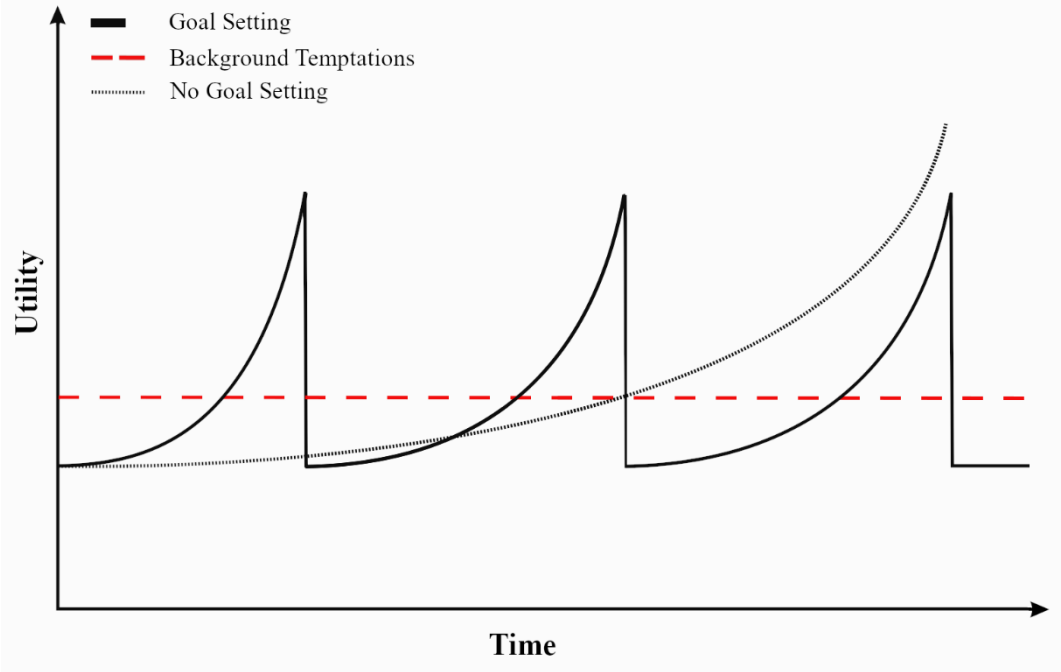

Figure 9: Motivational Effects of Goal Setting in Temporal Motivation Theory[620]

However, it is also important to keep the difficulty of goals in mind. Dividing a large goal into several sub goals will reduce the complexity and difficulty of these sub goals. Consequently, the motivational effect of these goals stemming from their difficulty would be lower compared to one large, final goal.

Therefore, it is important to weigh up the additional motivational effects of dividing goals against the decreased difficulty of the resulting sub goals. There will exist a threshold where a further division of sub goals would no longer lead to an improvement in motivation but rather the opposite as the reduced difficulty will outweigh the advantages of goal proximity.

As Steel and König suggest, these circumstances can be used to design incentive schemes based on a decision-maker's personality: More impulsive individuals could

[619] See Gröpel/Steel (2008), p. 407.
[620] Own Depiction based Steel/König (2006), p. 904.

be targeted by more frequent and less difficult sub goals than those with a greater need for achievement.[621]

Overall, Temporal Motivation Theory makes valuable contributions towards incentive schemes and extends suggestions made by Goal Setting Theory. To achieve a greater amount of motivation and, thus, effort, larger goals should be divided into several sub goals spread over time. The frequency and difficulty of these sub goals should then depend on the decision-maker's personality to maximize the effect of the goals set.

5.6 Inequity Aversion

Another important aspect to consider regarding the setting of incentive systems is the so-called "Inequity Aversion", an aspect of behavioral economics that deals with the perception of fairness and inequity. Inequity (or at least the feeling of inequity) has been linked with injurious behavior such as lower productivity, loss of group cohesion, theft, and higher levels of employee turnover.[622] In examining Inequity Aversion, this section concentrates on the decision-maker's perceived fairness of his compensation.

In principle, there are two different components of fairness: Procedural and distributive fairness.

Procedural fairness deals with decision-making processes and an individual's assessment of their fairness. Here, several aspects are considered by the individual when evaluating the procedural fairness of a process. For example, the appreciation of his opinion/suggestions regarding the process, the kind of information used for it, or the consistency of outcomes resulting from the decision-making process are taken into account.[623]

Meanwhile, *distributive fairness* deals not only with the distribution of material elements in an exchange,[624] but also with the distribution of rewards in compensation systems. In a principal-agent relationship, both the principal and the agent want to receive the maximum material amount that they consider fair based on distributional norms. According to distributive fairness, they also consider the outcome of their counterpart and are willing to give up part of their own income to ensure overall fairness.[625] However, agents in this context not only take the distributive fairness between them

621 See Steel/König (2006), p. 904.
622 See Cowherd/Levine (1992); Bloom (1999).
623 See Colquitt et al. (2001), p. 426.
624 See Colquit et al. (2001), p. 426.
625 See Bosse/Phillips (2016), p. 282.

and the principal into account, they also compare their compensation to that of similar agents both within the company and in other companies. Should they consider another manager to be paid at a higher level despite having lower performance than them or vice versa, they will perceive this circumstance as an inequitable outcome.[626]
Due to the focus on compensation settings and the concept of Inequity Aversion in particular, the focal point of this section is on *distributive fairness*.

Inequity Aversion or, as it is also known, "demoralization costs"[627] deals with the kind of inequitable outcomes that constitute distributive fairness.[628] It describes the circumstance that people tend to resist these inequitable outcomes either concerning their own income relative to others or amongst other people. As mentioned in the previous paragraph, people are even willing to give up parts of their income to restore fairness.
Self-centered inequity aversion, meanwhile, is given when individuals care solely about inequity regarding their own income relative to that of others and ignore inequity amongst other people.[629]

Inequity Aversion offers an additional perspective to the design of compensation systems, especially when it comes to their reception by the recipients. It also provides an explanation for the basic requirement of "Fairness" in compensation systems mentioned in Section 3.6.2. The behavior of decision-makers is not only influenced by their efforts to maximize utility but also by the perceived fairness of their compensation. Actions infringing norms of fairness/the perception of fairness can provoke a backlash in the form of inimical behavior.[630] This behavior can result in many sorts of actions described as hostile and retaliatory such as vengeance and may, therefore, be even more damaging to shareholders than the assumed self-centered behavior of normal agents.[631] Consequently, it is extremely important for a company to make sure that incentive systems are perceived as fair. If this is achieved, the targeted individual may even react positively and be willing to expend more effort towards his actions, thus rewarding the company for maintaining fairness norms.[632]

[626] See Shafir/Diamond/Tversky (1997), pp. 350-353.
[627] See Michelman (1967), p. 1214.
[628] See Fehr/Schmidt (1999), p. 819.
[629] See Fehr/Schmidt (1999), p. 819.
[630] See Greenberg (1988), p. 611; Fong/Misangyi/Tosi (2010), pp. 641-643.
[631] See Fehr/Gächter (2000), pp. 161-163; Hoff (2010), pp. 1467-1468.
[632] See Bosse/Phillips (2016), p. 282.

The above-described effect of Inequity Aversion has been studied for a long time and, given its ubiquity in every situation of human life, was even termed a "hypernorm" by Dunfee.[633] Individuals often do not solely value their satisfaction based on their own wealth and achievements but tend to compare them to similar individuals (e.g. the famous animosity and competition amongst neighbors). This especially holds true for compensation[634] and, in this realm, a negative inequality is much more likely to be perceived negatively than a positive one. Individuals will suffer more when they perceive their compensation as being too low compared to others than when they deem it as too high.[635] This is mainly due to the perceived social standings and the human drive to be respected and valued.[636]

The importance of inequity aversion relating to relative payoffs has also been empirically proven. For example, Clark and Oswald have shown that an individual's job satisfaction is significantly influenced by the comparison of incomes with others. In their study, the comparison income of the peer group resulted in a large and significant negative impact on an individual's job satisfaction.[637] Furthermore, Loewenstein, Thompson, and Bazerman found proof that disadvantageous inequality weighs stronger than advantageous inequality. Given their own income, subjects in their study reacted much more strongly and, in particular, in a much more negative manner to the peer group having a higher income compared to theirs than the peer group having lower incomes.[638]

In the realm of executive compensation, executives will form the expectation of fair treatment by comparing their income to a peer group, namely other managers within the company or similar managers in other companies.[639] Normally, as psychologists have noted, when doing this executives will see themselves as "better than average".[640] This overconfidence in their own abilities also plays a big role when it comes to the self-assessment of an executive's own payment.[641] If his pay package falls below the norm, this can cause problems with the morale and also the motivation of the executive as he will see himself as being undervalued in comparison to the peer group of

633 See Dunfee (2006), p. 305.
634 See Shafir/Diamond/Tversky (1997), pp. 350-353.
635 See Fehr/Schmidt (1999), pp. 820-821.
636 See Grund/Martin (2017), p. 74.
637 See Clark/Oswald (1996).
638 See Loewenstein/Thompson/Bazerman (1989).
639 See Bosse/Phillips (2016), p. 283.
640 See Dunning/Meyerowitz/Holzberg (1989), p. 1088; Alicke et al. (1995), p. 804.
641 See Malmendier/Tate (2005), pp. 652-653.

managers which he, from his own perspective, sees as inferior or at most equal to himself.[642] Kenneth Feinberg noted on this matter that adequate compensation is seen by executives as a symbol of self-worth and "[…] individual fulfillment, that without generous pay, company officials would view themselves as failures. Individual success could be determined only by comparing oneself to the competition, and dollars paid would be the deciding factor."[643] Thus, if an executive identifies another executive at a similar company who, in his mind, is doing a similar job but is paid at a level higher than himself, he will not only perceive unfairness but also see this as a threat to his social status. Comparing his payments to the other executive's would then result in either his view that he himself is undervalued by his employer or it could harm the executive's belief in himself. This could result in the executive reacting in two ways: either he might attempt to lower his effort to match his compensation-to-performance ratio based on the comparison with the other executive, or he could strive for greater compensation, but become demotivated if he does not obtain it.[644]

Overall, disadvantageous inequity perceived by the manager not only leads to slacking performances and lower effort, it can also cause the executive to be much more susceptible to offers from other companies/competitors.[645] Therefore, executives perceiving inequity can generate high costs for their company due to irrational/erratic behavior and especially higher costs than under the expectations of the classical and neoclassical economic models. Generally, perceiving inequity aversion may lead to lower effort and overall decreased job satisfaction, resulting in behavior and performances that are counterproductive for shareholders.

In order to take heed of the problem of inequity aversion, managers should be paid at least at the market level. A compensation that is below average might otherwise demotivate the manager and lead to potentially harmful behavior. Based on the same reasoning, it is also very important to note that compensations amongst managers within a company who are at the same level should not differ. An argument can also be made for compensating managers above the market level: As executives base their self-assessment on their compensation, the fact that their pay is at higher levels than that of comparable managers could give them a motivational boost through their improved self-worth and the feeling of being valued as above average by the company.

642 See Kim/Kogut/Yang (2015), p. 303.
643 Feinberg (2012), p. 104.
644 See Greenberg (1988), p. 611.
645 See Kim/Kogut/Yang (2015), p. 303.

One must, however, be mindful that such a pay practice will inadvertently lead to a spiraling of increasing wages across the market. Consequently, there will be the further need to raise one's manager's pay after some time if one wants to continue compensating the manager above the market level.

5.7 Generations, Norms, Cultures, and Personality

5.7.1 Introduction

One of the main criticisms of agency-theoretical models is that these models are undersocialized. Therefore, this chapter has the aim of incorporating important aspects of human nature into the design of compensation systems. This will be achieved by not only looking at an individual's personality but also the norms and cultures prevalent within his environment that will shape his behavior.

5.7.2 Generations Y and Z—Myth or Reality?

A topic which has become very popular in recent years has been that of different generations, especially the distinction between the Generations X, Y, and Z. One example is the so-called "Shell Jugendstudie" which is done every 4 to 6 years in Germany to evaluate the characteristics and attitudes of young people.[646] Based on the perspective of the authors, every 15 years a new generation is formed that is shaped by events that result in different attitudes compared to previous generations.[647]

A multitude of researchers has proclaimed pronounced differences between generations that not only influence the daily lives but also the attitudes towards jobs and employment as a whole. For example, Hurrelmann and Albrecht claim that Generation Y differs relative to Generation X in several different categories, namely in that Generation Y focus on self-fulfillment, accentuate the importance of success on the job, have less confidence regarding the future (worries about their job safety and their economic situation), and low levels of political interest.[648] Giesenbauer, Mürdter, and Stamov Roßnagel describe Generation Y as being disloyal towards their employers as many of them have switched companies once or more before. Additionally, Generation Y tend to demand monthly feedback from their employers, act in a very self-confident manner, have a high focus on their work-life balance and, subsequently, their free time, and emphasize individuality and independence, meaning that the financial aspects of

[646] See Hurrelmann et al. (2002); Albert et al. (2006); Albert et al. (2010); Albert et al. (2015).
[647] See Hurrelmann/Albrecht (2014), p. 16.
[648] See Schröder (2018), p. 472.

a job are not the deciding factor when choosing an employer.[649]
However, a certain degree of care should be taken with intergenerational comparisons and characterizations of generations, if only because characteristics such as those mentioned above may not be exclusive to Generation Y, say, and also because a generation might often be described using characteristics that stand in complete contrast to each other. For example, Hurrelmann and Albrecht proclaim that Generation Y has a high focus on the job and career whilst, in parallel, a good working climate and the compatibility of job and family would be much more important than a quick career on the job.[650]

These problems become very evident when looking at the classical theory of generations by Karl Mannheim, who states that a new generation is only born when individuals participate in and are defined by common events and experiences.[651] Consequently, a new generation will only be formed when a birth cohort is influenced by the same societal events during their adolescence and the first years of adulthood and that they will remain influenced by these events for the rest of their lives. It is important to remark, however, that these events can only form a new generation if they solely influence this birth cohort without also changing the behavior of the rest of society.[652] Under this definition, climate change would not be an event that leads to the birth of a new generation as it influences and alters the behavior and attitudes of vast parts of society. As a consequence, simply defining new generations every 15 years cannot be properly justified.[653] New generations can potentially be born in well-defined steps, however, this does not have to be the case. For example, Szydlik criticizes the concept of the Generations X, Y, and Z claiming that people being allocated to these three different generations are barely connected by common and drastic events that would lead to a separation into these three different categories of generations. He claims that there is no common and specific generational consciousness that would be needed to define these three different generations.[654]

The attitudes of the proclaimed different generations have also been tested empirically. For example, Schröder investigated what he calls the "generational myth" and showed

649 See Giesenbauer/Mürdter/Stamov Roßnagel (2017), pp. 13-14.
650 See Hurrelmann/Albrecht (2014), pp. 33, 42.
651 See Mannheim/Wolff (1970), p. 536.
652 See Costanza et al. (2012), p. 377.
653 See Schröder (2018), p. 471.
654 See Szydlik (2004), p. 9.

that, as regards their attitudes, goals, worries, or their societal and political interests, German after-war cohorts barely differ from younger birth cohorts. He concludes that the big generational differences proclaimed by many authors regarding generations like the baby boomers, X, or Y barely exist.[655] In his studies, he in fact finds characteristics that are opposite to those attributed to the latest generations. For example, instead of political disinterest, Schröder found a slightly increased willingness for volunteer work in Generation Y. Instead of economic worries and the orientation towards a career, he found no pronounced importance of success on the job and slightly fewer worries regarding the economic situation. Therefore, he concludes that youth studies may track changes in attitudes amongst youth cohorts, however, he also points out that these changes in attitude are not a phenomenon of a new generation but rather an effect on the entire society. Furthermore, controlling for periodical effects, Schröder finds hardly any changes in attitudes between the proclaimed different generations.[656]
Another study that was conducted by the Jacobs University Bremen on behalf of the Daimler AG concluded that the participants of the study, who were either from Generation X or Y, were very similar regarding their needs and wants even though they themselves perceived a rather large difference amongst generations.[657]
Further evidence against the separation into generations every 15 years was provided by the ifaa. Based on their study, the organization concluded that their results discounted the generalized characterizations of different generations, claiming that the only discernable difference between Generations X, Y, and Z concerns digital competence.[658]

Based on the empirical evidence provided by the named studies and the often- contradictory attribution of characteristics to different generations, there should be no differences made amongst generations when it comes to executive compensation. Most often, the changes in attitudes perceived in younger generations are not only changes within these generations but overall changes within society. Consequently, accounting for generational differences will not be part of the recommendations of this work. If compensation systems wish to focus on changes in attitude and perception, executive pay should concentrate on changes in overall national perceptions rather than solely focusing on the youngest generations and adapting compensation for them but not the

655 See Schröder (2018), p. 469.
656 See Schröder (2018), pp. 490-492.
657 See Stamov Roßnagel (2017).
658 See Adenauer (2018), p. 4.

rest of the employees. Changes in attitudes are not effects which solely concern young generations—these developments change society as a whole.

5.7.3 Social Norms

5.7.3.1 The Basics of Social Norms

A country's national culture influences not only the perception of compensation systems and an executive's behavior but also the region in which the executive lives and works, and especially how that region's social norms may play an important role. Merriman and Sen, for example, argue that the efficiency of compensation systems potentially depends on the social norms within a region.[659]

Institutional theorists like Scott argue that the norms within an executive's environment will shape his cognition and his behavior.[660] This can be a result of the common perceptions and values in this environment which subconsciously rub off on him.[661] These norms consist of social and cultural norms, which together form a system of beliefs and practices.[662] While cultural norms are often similar across a country, they can differ between regions.

Social norms provide people living within a region with a common understanding of judgment and conduct.[663] This common understanding and, thus, the regional social norms will be especially important in situations of uncertainty (e.g. decision processes by executives) as clear guidelines will help to navigate these situations, offering support and backing.[664] Conforming to local social norms will be rewarded through praise and a higher social status or the feelings of pride and the sense of membership.[665] Contrary to this, violating or breaching the regional social norms will be sanctioned either through mechanisms by other members of the group (shame or ostracization) or will lead to feelings of guilt.[666] Guilt may even be perceived if the actions that led to the breach or violation are not observable.[667] Thus, it is argued that individuals within a region will confirm to its social norms to avoid sanctions and prevent the loss of social membership and its rewards and benefits.[668] Within the realm of executive decision-

[659] See Merriman/Sen (2012), p. 866.
[660] See Scott (2014), pp. 262-265.
[661] See Marquis/Glynn/Davis (2007), pp. 932-933.
[662] See Scott (2014), pp. 262-265.
[663] See Keefer/Knack (2008), p. 702; Scott (2014), p. 264.
[664] See Geletkanycz/Hambrick (1997), pp. 675-676.
[665] See O'Sullivan/Zolotoy/Martin (2018), p. 6.
[666] See O'Sullivan/Zolotoy/Martin (2018), p. 6.
[667] See Elster (1989), pp. 104-105; Dyreng/Maydew/Williams (2012), p. 848.
[668] See O'Sullivan/Zolotoy/Martin (2018), p. 6.

making, empirical studies have shown that the higher the level of managerial discretion, the more important the social norms within a region for the decision-maker become.[669]

Social norms need to be distinguished from other types of norms which are often seen as similar, such as moral norms, legal norms, or private norms. For example, according to Elster, legal norms are enforced by specialists that enact them out of self-interest (who stand to lose their job if these are not enacted). Meanwhile, social norms are kept under surveillance by the general public and are not exclusively enacted out of self-interest.[670] Examples of social norms are religious norms, norms that regulate the use of money, norms of cooperation, consumption norms, and norms of retribution and reciprocity.[671]

Similar to national culture, a region's social norms could have an impact on the reception of different compensation systems and on the way in which executives should be compensated. Some authors go as far as to say that ignoring the social context in which a company operates leads to the undersocialization of a compensation system and, thus, negative consequences.[672]

5.7.3.2 Religion as a Social Norm

The shaping of cognition and behavior by a social norm has been empirically shown for religious norms: People living in areas that are highly religious or have a high share of religious population tend to incorporate the local religious social norms into their own behavior even if they themselves are not religious.[673] This, therefore, also applies to executives who may incorporate the norms of the local region in which their company operates and in which they often tend to live as well. In their literature surveys on the role of religion in decision-making, Lehrer and Iannaccone point out that the affiliation to a religious group or the incorporation of that group's norms and behavior can have a meaningful impact on subsequent actions.[674] However, as McQuillan emphasizes, "[…] religious values […] are likely to play a critical role in shaping demographic behavior only when religious authorities have at their disposal a menu of

669 See Zolotoy/O'Sullivan/Martin (2018), p. 36.
670 See Elster (1989), p. 100.
671 See Elster (1989), pp. 100-101.
672 See Aguilera/Jackson (2003), p. 448; Donaldson (2012), pp. 263-264.
673 See Stark/Bainbridge (1996); van Tubergen/te Grotenhuis/Ultee (2005); Boone/Khurana/Raman (2013).
674 See Iannaccone (1998), pp. 1476-1478; Lehrer (2004), pp. 721-722.

rewards and sanctions that will encourage the faithful to conform."[675] Consequently, these local religious norms might influence the executive's behavior and decision-making.[676]

This assumption has been shown to hold true, as several empirical studies have shown that local religious social norms influence the judgment and behavior of executives of local companies.[677] Religion and, subsequently, religious social norms not only criticize but also punish ethically questionable behavior. Thus, living in a religious region can have substantial effects on an executive's willingness to manipulate or undertake fraudulent actions.

Indeed, empirical studies have demonstrated that the strength of religiosity within a region has a measurable impact on an executive's or a company's wrongdoings. Zolotoy, O'Sullivan, and Martin show that, via their disapproval of overly risky actions and unethical conduct, religious social norms can ameliorate negative impacts stemming from the suboptimal setting of incentives in compensation systems.[678] Also, options backdating, financial misreporting, aggressive tax avoidance, earnings management, and the manipulation of corporate information have all been shown to be unlikelier within religious regions.[679] The religious strength within a region also has an impact on risk-taking within a company: Companies operating within religious regions have been shown to employ less risky financial reporting practices, are less likely to engage in speculative actions, and have lower risks of a stock price crash.[680] Others argue that the religious strength within a region may also have an effect on the perception of equity incentives. As Zolotoy, O'Sullivan, and Martin found in their study on the effects of local religious social norms, the strength of religiosity within a region weakens the relationship between equity incentives and firm value.[681]

Overall, the strength of local religious norms can have a pronounced effect on executives' decision-making as well as their perception of incentives within their compensation systems. Given that the strength of religious social norms impacts the likelihood of fraudulent behavior and manipulation, companies within less religious regions

675 McQuillan (2004), pp. 46-47.
676 See Berrone et al. (2010), p. 90.
677 See Hilary/Hui (2009), p. 472; Grullon/Kanatas/Weston (2010), p. 25; McGuire/Omer/Sharp (2012); Callen/Fang (2015).
678 See Zolotoy/O'Sullivan/ Martin (2018), pp. 32, 36.
679 See Grullon/Kanatas/Weston (2010); Dyreng/Hanlon/Maydew (2012); Boone/Khurana/Raman (2013); Callen/Fang (2015); Li/Cai (2016), pp. 235, 239.
680 See Hilary/Hui (2009), p. 472; McGuire/Omer/Sharp (2012); Callen/Fang (2015).
681 See Zolotoy/O'Sullivan/ Martin (2018), pp. 32, 36.

should pay higher attention to elements within the compensation system that deter executives from indulging in fraudulent behavior. In highly religious regions, on the other hand, executives need to be induced to take more risk by "convexifying" their compensation function on a higher level, i.e., $s''(x) > 0$, to counteract the negative effect of religiosity on risk-taking. However, this also raises the question of whether the focus on specific regions within a country might not lead to higher levels of inequity aversion, as comparisons of managers within religious regions with their counterparts in less religious regions would show different compensation structures and, more importantly, different compensation levels. Thus, the potential reduction of motivation through inequity aversion could outweigh the benefits of adjusting compensation systems to the region in which the company operates.

5.7.4 Company Culture

5.7.4.1 The Basics of Company Culture

Aside from social norms, compensation systems can also be adapted to the specific requirements of the company itself. Here, the company culture/corporate culture plays an important role when attempting to adjust an executive's compensation in such a way that his behavior matches the desired behavior of the company within its environment. By not only adjusting compensation systems to companies' strategies and objectives but also its cultures and values, management theory researchers predict improved motivation and performance of executives.[682]

Corporate culture can be defined in several ways. One possibility is to define corporate culture as a sort of code of communication within the organization.[683] Another from O'Reilly and Chatman defines corporate culture as "[…] a set of norms and values that are widely shared and strongly held throughout the organization […]."[684] Similar to local social norms, the norms and values within a company that define corporate culture would act as kind of a "social control" by defining wanted and unwanted behavior and also reward in the case of compliance and punishment in the case of noncompliance.

One way to categorize a company's culture is along one of Hofstede's dimensions used to define national culture: individualism-collectivism.[685] Companies with individualistic cultures will accept competition amongst their employees whereas collective

[682] See Balkin/Gomez-Mejia (1987), p. 173.
[683] See Cremer (1993), pp. 361-362; Schein (2010), pp. 3-4, 14.
[684] O'Reilly/Chatman (1996), p. 166.
[685] See Chatman/Barsade (1995).

organizations will emphasize shared decision-making and a much lower level of competition amongst their employees. Depending on the culture a company is striving for, compensation systems may vary as the type of bonus can depend upon the level of individualism or collectivism. For example, a company that has a very individualistic culture will have to use more individual performance targets in order to match the compensation system to its culture. Meanwhile, collectivist organizations should focus much more on team goals to underline and promote shared decision-making and the high levels of teamwork. Of course, a company's culture can also be influenced and even changed by the type of compensation system that is employed.[686] However, a mismatch between the compensation system and the company culture can lead to adverse incentives, harmful behavior or reduced performance.

There are also other ways to categorize a company's culture as, similar to national culture, it consists of different elements that shape the picture of the organization. One example is the so-called "Competing Values Framework", which is the subject of the next section.

5.7.4.2 The Competing Values Framework

The Competing Values Framework has been studied and tested within organizations for more than 25 years.[687] It was developed by Quinn and Rohrbaugh, who used multidimensional scaling to devise a spatial model of organizational effectiveness. Over the course of their studies, they identified three major dimensions: flexibility-control, internal-external, and means-ends[688] which were later reduced to two dimensions by removing means-ends. Bringing together these two dimensions results in the four quadrants depicted in *Figure 10* below. It is suggested that these four quadrants represent the underlying values of an organization and can therefore represent a company's culture and its value orientation.[689] Consequently, a company's culture can be analyzed along two lines: First, by its internal, more person-focused emphasis (e.g. integration and maintenance of activities) versus its external, more organizational one (e.g. differentiation and competitiveness). Second, by the focus on stability and control through mechanistic processes versus the focus on flexibility and change through organic

686 See Kuhn (2009), p. 1636.
687 See for the time span the time difference between, e.g. Quinn/Rohrbaugh (1983) and Cameron/Quinn (2006).
688 See Quinn/Rohrbaugh (1983), pp. 369-371.
689 See Kalliath/Bluedorn/Gillespie (1999), p. 145.

processes.[690] Each of the four different company cultures can also be distinguished based on their values, their style of leadership, and their shared beliefs.[691]

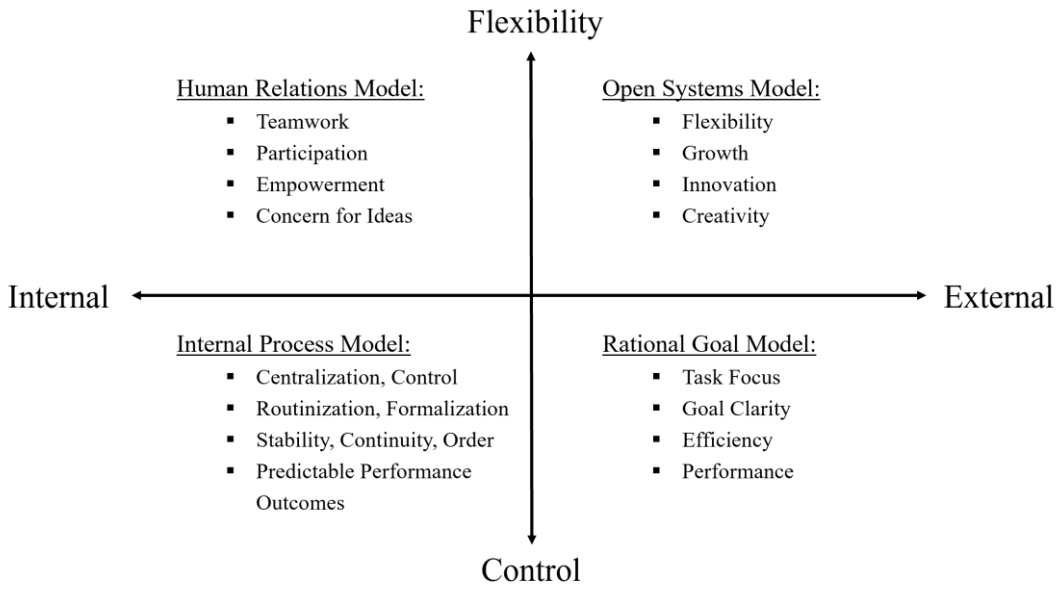

Figure 10: The Four Quadrants of the Competing Values Framework[692]

The Competing Values Framework consequently identifies four different types of company cultures, each with a different focus and orientation, which can be seen in *Figure 11* below. The so-called "hierarchy culture" has an internal focus and concentrates on control. The "clan culture" also has an internal focus but emphasizes flexibility. Meanwhile, the "market culture" has an external focus and concentrates on control while the "adhocracy culture" also has an external focus but emphasizes flexibility.[693] It is important to note that every organization incorporates all four types to some degree. However, there usually is one dominant type of culture that is prevalent within an organization.[694] Thus, organizations usually have a set of core behaviors and characteristics that influence their strategic decision-making and the environment within a company.[695]

[690] See Kwan/Walker (2004), p. 23; Madhani (2014), p. 106
[691] See Quinn/Cameron (1983), pp. 43-44; Madhani (2014), p. 106.
[692] Own Depiction based on Kalliath/Bluedorn/Gillespie (1999), p. 146.
[693] See Madhani (2014), p. 106.
[694] See Quinn/Cameron (1983), pp. 43-44; Madhani (2014), p. 106.
[695] See Cameron (2006), p. 32.

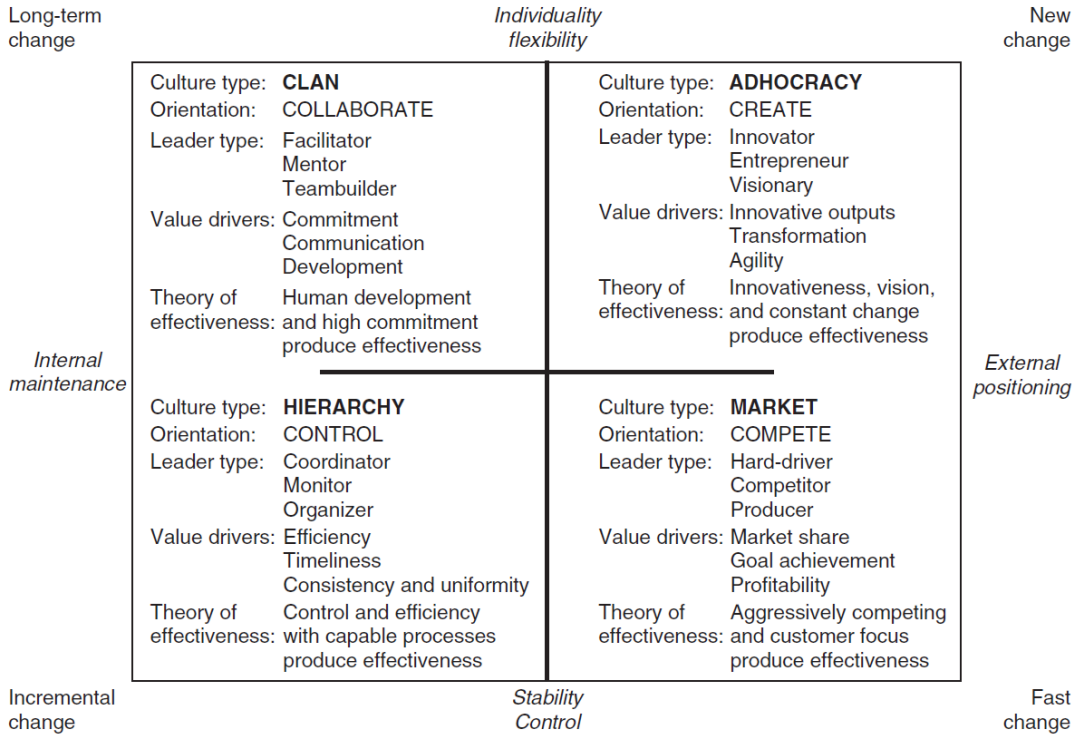

Figure 11: The Four Company Cultures Under the Competing Values Framework[696]

Based on the dominant culture and its characteristics, different elements of compensation systems will have different effects. Employees working within a certain company culture will react differently to compensation elements. On the one hand, bringing compensation systems in line with company culture will foster positive effects and may create synergies that allow a company to gain a competitive advantage. On the other, using compensation elements that clash with company culture may have negative effects on employee performance and motivation, and could have a harmful effect on company performance. Therefore, it is important to analyze the different types of company cultures within the Competing Values Framework to identify the best working compensation structures for each of them.

The first culture, the *hierarchy culture*, has an internal focus and concentrates on control. It is characterized by a well-structured workplace which is highly centralized and defined by a high degree of formality as concerns procedures and standardized processes. Rule-reinforcement, stability, and control are maintained through effective communication and information management. Overall, a hierarchy culture can be seen as bureaucratic and system-oriented, relying on formal controls. It is usually found within a stable or highly regulated environment where failure is not an option and

[696] Graphic taken from Cameron (2006), p. 32.

where such a culture can be effective. Examples include industries such as medicine, military services, and transportation. However, due to its high degree of standardization and formalization, it does not work well in an uncertain and dynamic environment.[697]

As hierarchy cultures operate in very stable and highly formalized environments, compensation systems used should emphasize the need for security, stability, and long-term thinking. Madhani also suggests that the compensation system within this culture should focus on loyalty, consistency, and efficiency. Fixed pay should, consequently, be the main element of compensation.[698] However, variable pay is still essential to promote long-term thinking. Components based on accounting measures like residual income should be the main focus here.

The second culture, the *clan culture*, has an internal focus and concentrates on flexibility. It is identified as a family-type organization that provides a friendly workplace with high levels of collaboration, participation, cooperation, and sharing. Loyalty, employee involvement, shared values, and personal commitment are very important. Contrary to the hierarchy culture, the clan culture uses few formal controls and relies more on informal controls through elements like social norms. These social norms within an organization require employees to comply with its strategy and way of approaching decision-making. Human and social capital are the main focus within clan cultures as these elements are seen as imperative to good performance and subsequent financial gains. Consequently, loyalty will be rewarded with high levels of job security. Clan cultures are most effective in uncertain environments that require stability.[699]

Because clan cultures usually operate in uncertain environments that require stability, the ratio of fixed to variable pay should lean more towards fixed pay. As clan cultures are very collectivistic and focus on shared decision-making, the focus of variable pay should lie more on collective than individual features.[700] Targets within a compensation system should, therefore, be based on team goals as well as overarching organizational goals so as to promote the feelings of collaboration and cooperation.

The next culture is the so-called *adhocracy culture* that has an external focus and concentrates on flexibility. It is characterized by innovation, high levels of future-

[697] See Cameron (2006), pp. 32-33; Cameron/Quinn (2006), p. 38; Yu/Wu (2009), p. 38; Madhani (2014), p. 107.
[698] See Madhani (2014), pp. 110-111.
[699] See Cameron (2006), p. 38; Cameron/Quinn (2006), pp. 41-43; Yu/Wu (2009), p. 38; Madhani (2014), p. 108.
[700] See Madhani (2014), p. 111.

orientation and, on the whole, a very entrepreneurial style of decision-making. An adhocracy is highly adaptive and flexible, and can, therefore, quickly make decisions and react to changes within its environment. It has low levels of centralization and formalization resulting in very few formal controls. A high degree of freedom in decision-making is promoted as it is seen as a key to success. Strategies aim towards the production of new products and the detection and use of new market niches. An adhocracy culture operates most comfortably in dynamic and fast-moving markets such as high-tech startups and within the fast-moving-consumer-goods market.[701]

As adhocracies operate in environments that require high levels of risk-taking and risk anticipation, the compensation system needs to be adjusted accordingly. Also, since the individual contributions of every manager and executive is highly important, individual goals and targets should be the main focus. However, so that a team effort can make rapid movements and adjustments within strategies, team goals should also be included. Given the fact that markets are dynamic and forever changing, goals may quickly become outdated, meaning they may either become too easy or impossible to reach. For this reason, challenging goals have to be set dynamically, preferably based on competitors' and overall market performances. Variable pay should be the emphasis of a compensation system, thus the ratio of fixed to variable pay should lean heavily towards the latter. As the attraction of especially skilled executives is highly important, variable compensation elements like stock options or stock are recommended.

The final company culture, the *market culture*, has an external focus and concentrates on control. A market culture is highly focused on efficiency and goal achievement. It is characterized by competitiveness and productivity which are at the core of its values. Aggressive competition and customer focus are also important. Furthermore, productivity, sales, and profits are of the utmost importance. Market cultures are not characterized by loyalty, cooperation, or a common system of social norms. An individual's success is measured by indicators like market shares, revenues, and budget achievement. The market culture is best used within hostile environments with choosy and value-oriented consumers.[702]

As market cultures are highly focused on productivity, sales, and profits and compete in very competitive markets, variable payment is highly important. Therefore, the ratio

[701] See Cameron (2006), p. 36; Cameron/Quinn (2006), pp. 43-45; Yu/Wu (2009), p. 38; Madhani (2014), p. 108.

[702] See Cameron (2006), pp. 34-36; Cameron/Quinn (2006), pp. 39-40; Yu/Wu (2009), p. 38; Madhani (2014), pp. 108-109.

between fixed and variable pay should lean strongly towards variable pay. Additionally, as efficiency and goal achievement play a big role, performance targets should be set at a challenging level which, similar to the adhocracy, should be designed in a flexible way that considers market development and the company's competitors. Individual performance targets and measures are at the forefront, however, to dampen the strong focus on individual performances, team goals should also be incorporated to ensure at least a certain level of cooperation amongst the executives. Furthermore, the high focus on profitability and performance will lead management to mainly focus on the short-term. Here, long-term incentives such as company shares or performance goals that span several years should be introduced in addition so as to prevent overly myopic behavior.

As can be seen, the different company cultures have very different characteristics, work best in different environments, and all have different compensation systems that suit them best. What is clear is that cultures with an internal focus and which promote stability should rely more on fixed pay and have a lower percentage of variable pay within their compensation systems. Meanwhile, companies that face high market pressures and work within very competitive environments should employ a higher amount of variable pay. In general, team goals should always be employed as well. In some cultures, they will promote the already high levels of cooperation whilst in others they will help balance the importance of individual performance and overall company performance.

Using the individual company culture within a compensation system is a highly useful tool to fit the compensation system to the exact specifications and requirements of a company and make sure that no negative effects stem from the system due to an incompatibility of the compensation with the culture innate to a company.

5.7.5 National Culture

5.7.5.1 The Basics of National Culture

Whilst generational differences have been shown to be more a consequence of an overall change in attitudes within a society, national culture is a very important determinant affecting executive payments. The effects of national culture regarding an executive's reaction towards compensation settings have been accorded significant attention in the literature and there is an abundance of evidence that national cultures strongly influence an executive's behavior, e.g. his strategic decision-making, his attitudes towards

risk, and his long-term orientation.[703]

A manager's behavior is often in close alignment with national culture, especially in situations of stress and uncertainty. As studies by Bailey and Spicer found, values that executives use and by which they are influenced can mainly be attributed to national culture.[704] Furthermore, Conyon and Murphy studied the differences in pay in the United Kingdom and the United States, concluding that at least parts of the observed pay differences could be based on differences in the national culture.[705]

Consequently, an international corporation must consider which social norms are emphasized within a country when developing their compensation standards within said country. As Newman and Nolan point out, American management theory often leads to the belief that compensation standards developed for the US could seamlessly be applied within other countries. However, as the authors also emphasize, differences in national cultures must be taken into account and, therefore, compensation settings and management practices should differ across countries.[706]

A simple transfer of compensation strategies from one country to another without accounting for social and cultural standards will often produce undesirable outcomes. This means that multinational enterprises have to adapt their compensation plans to the countries in which they are operating so as to achieve both a high company performance and, clearly, high performances by the managers that are in the interests of a company's shareholders. Local or national cultural norms and their effects on individuals, their performance, and the subsequent performance of the overall company should be taken into account when evaluating different methods of rewarding executives.

To get an understanding of how national culture influences an individual's perception of compensation systems, first and foremost it is important to understand what the concept of culture is. Culture is based on meanings and preferences which are developed within a group based on environmental forces and internal integration.[707] In his book on organizational culture and leadership, Schein adds the so-called artifacts which he defines as visible products of a group, such as architecture, language, technology, and products as well as artistic creations, emotional displays, its myths and

[703] See Schneider/DeMeyer (1991); Luthans/Welsh/Rosenkrantz (1993); Puffer (1993), p. 479.
[704] See Bailey/Spicer (2007).
[705] See Murphy/Conyon (2000), pp. 667-669.
[706] See Newman/Nollen (1996), pp. 753-754.
[707] See Hofstede (1997), pp. 4-5; Hofstede (2001), pp. 9-10.

stories, and its published list of values and its observable rituals.[708] Jaeger calls national cultures "[…] common theories of behavior or mental programs that are shared by a group of individuals."[709]

National culture then is defined as the combination of values, beliefs, and assumptions that are taught to children from an early age and which separate one group of people from another.[710] These values, beliefs, and assumptions subsequently act as a reference that guides members of the group as regards their behavior towards the environment, other groups, and within the group itself.[711] Hofstede subsequently describes this reference as "software of the mind".[712]

As *Figure 12* shows, differences in national culture are based on a broad set of forces such as geography, genetic factors, or technological development. As a consequence, external influences, origins, and value systems that comprise national culture not only influence the behavior of the group but also the structure and functioning of organizations within a national culture. This organizational culture or philosophy will consequently affect the way that employees cope with uncertainty or difficult events.[713]

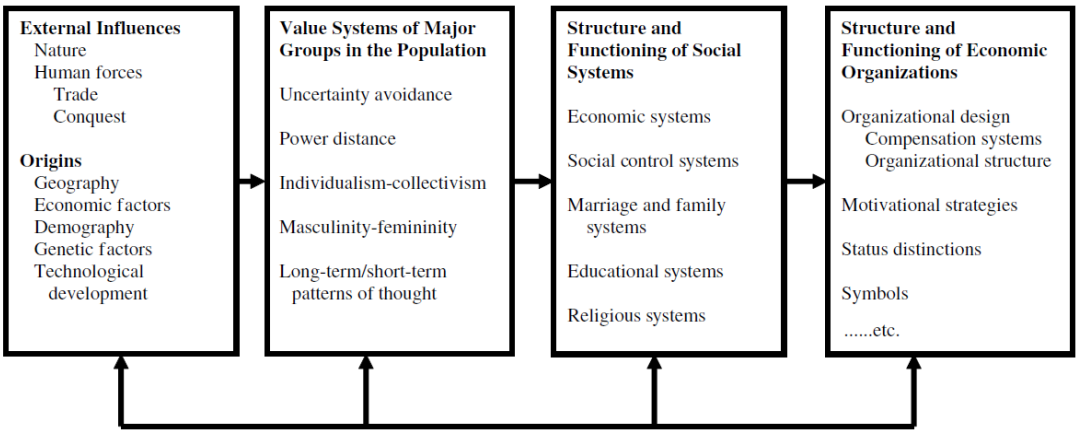

Figure 12: Sources and Consequences of Culture[714]

Taking the countries of Japan and the United States as an example, the differences in national culture between these two countries may be partially explained by differences in their origin and geography. Settlers in the United States found a wide swath of land and many resources, promoting the potential for smaller groups or families to survive

[708] See Schein (2010), p. 23.
[709] Jaeger (1986), p. 179.
[710] See Hofstede (1997), p. 5.
[711] See Geletkanycz (1997), p. 617.
[712] See Hofstede (1997), p. 4.
[713] See Schein (2010), p. 27.
[714] Graphic taken from Tosi/Greckhamer (2004), p. 658.

on their own, fostering so-called *individualism*. Meanwhile, the islands of Japan have only limited resources and land, forcing the inhabitants to work much closer together in order to survive and prosper.[715]

Overall, it can be said that national culture is an integral part of society and its individuals' behaviors. It is not only reflected in an individual's behavior but also in the way he approaches work, compensation settings, and his way of evaluating different compensation methods. Differences across cultures in compensation are a result of the "[…] culturally constructed notions of production, consumption, circulation, and exchange […]"[716] and can be best understood by knowing the nature of money within "[…] the cultural matrix into which it is incorporated."[717] Compensation practices which do not incorporate the values of national culture may lead executives to become dissatisfied and, thus, potentially undermine their motivation, effort, and performance.[718] Consequently, compensation plans have to pay special attention to national culture.

5.7.5.2 Hofstede's Culture Dimensions

One possibility method of categorizing national cultures is that of Hofstede's culture dimensions. Using a database with survey responses of 116,000 employees across 50 countries, Hofstede concluded that national culture could be defined by four dimensions, to which he later added a fifth. These dimensions are power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity, and long-term versus short-term orientation.[719]

First off, *power distance* deals with the distribution of power in the social system. It categorizes the willingness of people to accept an unequal distribution of power and also measures the overall power and status distribution within a country. While some nations accept a large power difference and inequality of power and status amongst their members (high power distance), other countries will not accept this (low power distance). While high-power-distance countries are characterized by stronger inequality amongst their members, low-power-distance countries are more egalitarian and promote values of equality. According to Hofstede, elitism is more pronounced in high

[715] See Tosi/Greckhamer (2004), p. 658.
[716] Parry/Bloch (1989), p. 1.
[717] Parry/Bloch (1989), p. 1.
[718] See Gomez-Mejia/Welbourne (1991), p. 31; Newman/Nollen (1996), p. 755.
[719] See Hofstede (1993), pp. 89-90; Hofstede (2001), p. 58.

power distance countries, leading to higher standings of those in charge, hence enabling them to reap greater benefits. Contrary to countries with lower power distance, this will be seen as culturally appropriate.[720]

Regarding organizations, the power distance within a country influences the levels of formal hierarchy, the degree of centralization, and the potential for participating in decision-making by employees. Countries with a high power distance have taller organizational structures as they adhere to the concentration of power amongst a few within the national culture they are organized in.[721] A consequence of high power distance and thus the taller organizational structures is the higher level of CEO pay within nations that embody the high power distance. Overall, there will be larger wage differentials amongst the different jobs within a company.

As a consequence of the differences in the distribution of power, executive compensation should also differ amongst high- and low-power-distance countries.

In *low-power-distance* countries, as egalitarianism and equality are more pronounced, the ratio of executives' pay and normal worker pay should be kept rather low, especially in comparison to countries with high power distance. Overall, employees should be more involved in decision-making within the company, so that in combination with the lower ratio of pay, a feeling of higher equality is pronounced. This stronger involvement in decision-making will be especially important when designing compensation systems for managers outside of the top management.

Meanwhile, in countries with a *high power distance*, the ratio of high-level executives' pay compared to that of normal workers should be at much higher levels to underline the pyramid structure within the company and society. High pay differences will be accepted within such a society and will also be demanded by executives. As executives want to emphasize their social status, they will strive for high levels of compensation and would be rather demotivated if they were not able to obtain them. Additionally, Gomez-Mejia and Welbourne suggest the provision of visible rewards that pronounce the value and success of top executives.[722]

Next, the dimension of *uncertainty avoidance* deals with a group's reaction to uncertainty, risk, and unstructured situations.[723] Consequently, uncertainty avoidance affects a company's policies, managerial decision-making, and the way employees deal

[720] See Hofstede (1997), pp. 24-28; Hofstede (2001), pp. 80-84; Merchant/Van der Stede (2012), p. 691.
[721] See Hofstede (1993), p. 89; Hofstede (2001), pp. 82-83.
[722] See Gomez-Mejia/Welbourne (1991), p. 31.
[723] See Hofstede (1993), p. 90; Hofstede (1997), pp. 109-110.

with uncertainty. This is not only the case in strategic situations but also as regards their compensation.

Cultures with *high uncertainty avoidance* will not feel comfortable in uncertain situations and will lean heavily on structure, rules, and well-defined procedures. They wish to act in a safe and steady manner instead of taking risks and venturing into unknown situations. Executives will want to minimize their exposure to risk and uncertainty in their compensation plans.[724] Meanwhile, cultures with *low uncertainty avoidance* will more easily accept uncertainty and will be much more comfortable in dealing with uncertain or unknown situations. They are also assumed to accept new/different approaches, procedures, and concepts. These cultures are much more open to risky approaches and new/unknown procedures or strategies. Contrary to countries with high uncertainty avoidance, executives will be more open towards variable bonuses that are characterized by higher levels of uncertainty and risk.[725]

In order to heed the low risk tolerance in countries with *high uncertainty avoidance*, compensation systems should either incorporate lower amounts of variable bonuses relative to fixed pay or the compensation function should be more "convexified". Compensation should not vary too much between executives to avoid the demotivating effects of inequity aversion. Additionally, Schuler and Rogovsky suggest seniority-based or skill-based compensation which, according to them, could offer more certainty in compensation systems.[726] Overall, compensation systems should be clearly specified, ensure consistency, and only contain a rather small portion of uncertain/risky compensation components. Otherwise, they could lead to adverse effects, for example even further reduction of the employees' readiness to take risks, thus, promoting even higher levels of risk aversion.

Contrary to this, compensation systems in cultures with *low uncertainty avoidance* should pronounce the risky components within the compensation, i.e. promoting a higher ratio of variable pay to fixed pay. The resulting increase of inequity in pay amongst executives should be accepted in order to harness the higher motivational and incentivizing effects due to the riskier payment structure.

The next dimension in Hofstede's model centers on the importance of individuality compared to collectivity, i.e. the accentuation of oneself compared to the importance

[724] See Gomez-Mejia/Welbourne (1991), pp. 35-36.
[725] See Hofstede (2001), pp. 145-148.
[726] See Schuler/Rogovsky (1998), p. 172.

of the group.[727] The so-called *individualism-collectivism* is another important component to differentiate different nations and their cultures.[728]

Individualistic countries are characterized by the importance of individual accomplishment, personal success, and the importance of financial status. People within such systems look out for themselves and mainly care about their own situation. They prefer individual tasks and targets compared to collective ones.[729]

Meanwhile, in *collective* cultures, the importance of society and groups is higher than that of the individual. Individuals will act to benefit the group and care a lot about equality and loyalty as these values rank higher than individual ones. Actions that harm the group will be punished by the loss of social status.[730]

Consequently, compensation systems need to be adjusted based on the importance of collectivity and individuality. On the one hand, team goals will have a bigger effect than individual ones in countries that are more *collective* than in individualistic countries. On the other, a study by Schuler and Rogovsky suggests that individual incentive compensation has a higher effect and is a better fit in countries that are more *individualistic*.[731] In collective cultures, individualistic targets and compensation elements should rather be avoided as they may neutralize the cohesiveness of the group. Inequity aversion is not as big a factor in collective countries compared to individualistic ones as the performance of the group/the organization ranks higher than the individual results. Social status in this type of country is not especially affected by the number of earnings but rather by the level of contribution to the company and the group. Consequently, designing compensation systems in collective cultures should mainly utilize team goals and need not worry excessively about inequity aversion. Furthermore, certain elements of the compensation system should reward loyalty and further bind the employee to the company.

Because people in *individualistic* countries will rather look out for themselves and value their success at high levels, the ratio of variable pay to fixed pay should be higher compared to collective countries. Furthermore, to counterbalance overly individualistic behavior, team goals need to also be introduced in the compensation system. As individuals highly value their own financial status and their own financial success and, therefore, may be induced to manipulate earnings to earn more, measures to reduce

[727] See Hofstede (1993), pp. 89-90.
[728] See Triandis (1989), pp. 512-513.
[729] See Gabrenya/Wang/Latane (1985), p. 223.
[730] See Hofstede (1997), p. 50.
[731] See Schuler/Rogovsky (1998), p. 172.

incentives for manipulation should be more pronounced. Additionally, it is important that the level of compensation in this type of culture matches that of competitors and that of other companies as people will evaluate their status based on their financial earnings. Thus, payment on at least the market level is highly important to avoid the negative effects of inequity aversion. Elements like company shares may additionally provide a higher motivation to achieve higher overall earnings.

The last of the first four dimensions of national culture identified by Hofstede is *masculinity-femininity*, which addresses two elements: gender roles and the attributes describe to them as well as the overall behavior within a culture. Some cultures are said to promote behavior which is closer to attributes ascribed to masculinity while other countries tend to behave in a more feminine manner.[732]

Masculine cultures are characterized by quick action and less pondering and planning.[733] Success and failure play a very important role within these cultures and companies within masculine cultures are characterized by managerial decisiveness and a high focus on performance and results. Contrary to this, feminine cultures have a higher social orientation, a stronger focus on social relationships, and act slower due to a higher emphasis on planning.[734]

To account for these differences, compensation systems in *masculine cultures* should set a higher focus on promoting planning and finding the best alternative in a strategic decision situation to avoid the rash decision-making that could otherwise take place. This can be achieved by promoting long-term incentives either through elements like bonus banks and averaging or through restricted stock. Meanwhile, compensation systems in feminine cultures should focus on avoiding inequity aversion and, therefore, reward executives at the market level to ensure the feelings of equality. Additionally, the focus on team goals over individual goals will further promote the already strong social relationships.

Hofstede's final dimension is the *long-term versus short-term orientation* of a culture. *Long-term-oriented* cultures according to Hofstede are future-oriented and characterized by patience, the sense towards the larger good, perseverance, and an emphasis on the future.[735] Meanwhile, *short-term-oriented* cultures focus more on the present and

[732] See Hofstede (1997), pp. 79-84.
[733] See Hofstede (1993), p. 90.
[734] See Geletkanycz (1997), p. 620.
[735] See Hofstede (1997), pp. 64-66.

want to uphold traditions and the stability of the system.[736]

As *long-term oriented* cultures are very future-oriented and place an emphasis on the future, long-term rewards will promote this behavior and additionally increase motivation. One potential compensation element to achieve this would be company shares. Meanwhile, compensation systems in *short-term-oriented* cultures should be specially designed to promote long-term thinking since this is in the interest of the shareholders. Similar to long-term-oriented cultures, company shares could provide an incentive for higher levels of long-term orientation. Additionally, dividing larger goals or targets within a bonus system into smaller sub goals and spreading these out over time could lead to higher levels of motivation as the higher proximity of the sub goals will better capture the characteristics of short-term-oriented cultures.

As can be seen, the adaptation of compensation systems to different national cultures is highly important if the best possible behavior of executives is to be achieved. Results from Schuler and Rogovsky's study suggest that national culture can be used to explain the observable differences in compensation structures and practices amongst different cultures. They show that the reception of stock ownership is very different amongst cultures based on the distinct forms of culture dimensions. Their results indicate that these types of compensation elements work best in countries that are more individualistic and have a rather low focus on uncertainty avoidance.[737] Consequently, executive compensation highly depends on the way cultures perceive money and the importance they attribute to it. Overall, the reactions to compensation systems amongst cultures differ greatly, depending on the amount of compensation, its source, and the potential degree of inequality these systems may create.[738] As executive compensation consists not only of fixed base payment but also bonuses and other incentives which themselves can be separated into short- and long-term elements, hence the design of compensation systems has to carefully incorporate the potential implications that a certain national culture can have on each of these components. Adhering to the different cultures of countries may help create competitive advantages. Failing to do so, however, can be extremely harmful to the organization and its shareholders.

National culture, for one, is especially useful when designing compensation systems for a local management team operating in a specific country. However, it can also be

[736] See Hofstede (1993), p. 90.
[737] See Schuler/Rogovsky (1998), p. 172.
[738] See Zelizer (1989), pp. 367-369.

used to adapt the compensation systems of top-level managers in a globally operating company in conjunction with the following chapter's recommendations.

5.7.6 Personality

5.7.6.1 The Basics of Personality

Apart from making compensation dependent on the national culture, the social norms, and the company culture, it is also possible to take a closer look at a manager's personality. Of course, based on his genetic pool and his environmental experiences, each individual is unique. The resulting personality of an individual is therefore an important determinant of his behavior and can provide additional benefits to a company when it is taken into account in the compensation system design. As Hambrick, Finkelstein, and Mooney state, there is "[…] no more fertile terrain in the organization sciences today than the study of executive cognitions, personality, interpersonal relations, and task conduct. […] Executives are finite, flawed human beings. But they reside in jobs where the stakes associated with their humanness—both positive and negative—are enormous."[739]

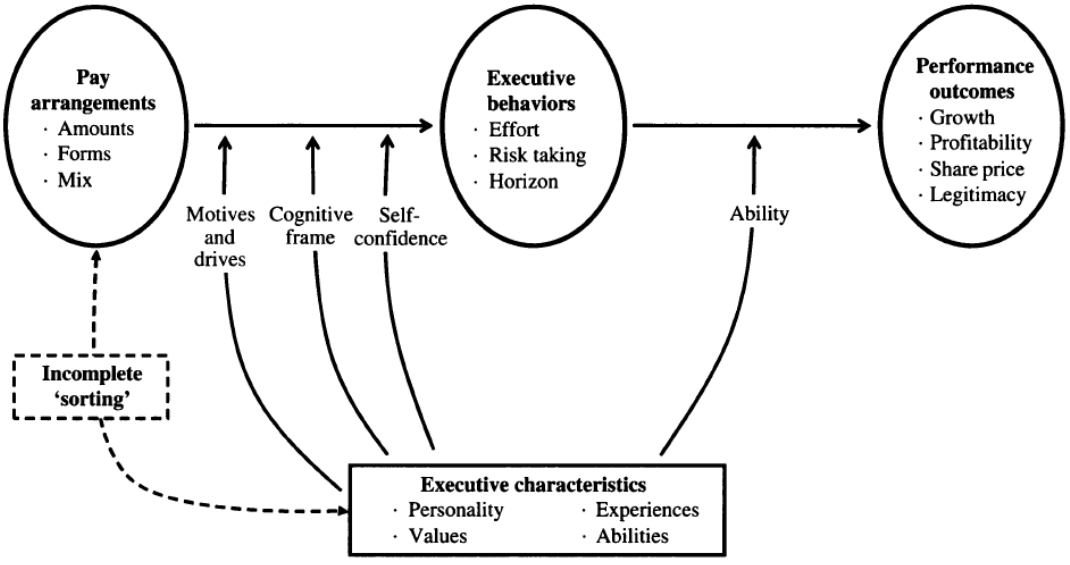

Figure 13: Effects of Personality on Pay and Performance[740]

Managers not only vary in their personalities,[741] indeed research has shown that they also have different values,[742] experiences,[743] and abilities.[744] These characteristics

739 Hambrick/Finkelstein/Mooney (2005b), p. 503.
740 Graphic taken from Wowak/Hambrick (2010), p. 806.
741 See Peterson et al. (2003).
742 See Agle/Mitchell/Sonnenfeld (1999).
743 See Bigley/Wiersema (2002).
744 See Palia (2000).

guide the manager, giving him a picture of what he wants and what he fears, and which thus drive his motivation.[745] Depending on his set of characteristics, a manager may weigh one strategic situation very differently compared to another. As *Figure 13* above shows, all of these components may have a substantial effect on a manager and his reaction to his compensation system. Indeed, this may not only have an effect on his subsequent motivation and performance, but also on the relative efficiency of the compensation system.

Other than personality, it is also important to consider values. These are enduring preferences formed by the national culture, the social norms within a region, and an individual's family. Their effects have been shown in previous sections. Additionally, other personal factors such as tenure and experience can influence strategic decision-making. This was discussed in Section 5.2.3.

Within this set of executive characteristics, personality can be seen as the most important as it has the strongest influence on motivation[746] and, thus, the greatest effect on an executive's decision-making. Personality itself is only vaguely defined and most often used to explain differences in behavior between two individuals. For example, the need for achievement or the confidence of taking risks may affect the reaction to a compensation system.[747]

One area where an individual's personality can have an influence on the compensation system is with regard to intrinsic motivation. For example, Frey distinguishes between extrinsically motivated employees (income maximizers or status seekers) and intrinsically motivated employees (loyalists and autonomists).[748]

He defines *income maximizers* as individuals who are only interested in earning money and, therefore, take their greatest utility and benefit from the money they earn. The work itself has only a fringe benefit for them and is seen more as a nuisance and a pure necessity for earning income. *Status seekers* are also extrinsically motivated but, for them, the evaluation and perception of other people are the most important. They also have only fringe benefits from the work itself but use it to define their own status while the money earned is used to purchase things that they can use to compare themselves favorably with reference groups like work colleagues, neighbors, or relatives.[749] For these two types of extrinsically motivated employees, performance-related pay has a

[745] See Finkelstein/Hambrick/Cannella (2009); pp. 49-50.
[746] See Barrick/Stewart/Piotrowski (2002), pp. 48-49.
[747] See Judge/Ilies (2002).
[748] See Frey (2002), pp. 74-76.
[749] See Frey (2002), p. 74.

very positive effect since it not only allows the income maximizer to increase his income but also helps the status seeker to distinguish himself from others.
On the other side there are intrinsically motivated employees, of course. Within this category, a *loyalist* is somebody who identifies himself with the company and also its goals. His interests are often in line with the company and he has no desire to act in a manner contrary to the company's interest.[750] The *autonomist* is mostly concerned with his own non-material goals and strives for self-fulfillment. He is strongly intrinsically motivated and mainly cares about his work and less about his compensation.[751] For these two types of intrinsically motivated employees, performance-related pay may be detrimental as it not only limits the autonomist's freedom and perception of self-fulfillment but may also signal to the loyalist that the company does not trust him. In both cases, using performance-related pay may wrongfully decrease motivation and, thus, performance.

Another factor that can influence an executive's reaction to compensation systems is his self-confidence. This can be defined as the subjective belief that one's own capabilities will be sufficient to achieve a certain goal.[752] The idea behind goal setting was discussed in Section 5.5.5. Whether performance targets or goals set are perceived as challenging but attainable or as impossible highly depends on an executive's belief in his own capabilities. Individuals will only pursue a given goal as long as they deem it possible to achieve. Otherwise, they will become demotivated, slack off and, thus, reduce their performance. Therefore, it is also highly important to consider an executive's self-confidence when setting his performance targets.

Overall, the resulting motives of executives will vary. Thus, the reaction to compensation systems will be highly affected by the executive's characteristics.[753] For example, the importance of security over money, and of the well-being of colleagues, or the perception of loss aversion can lead to incentive systems having the opposite effect of that which is expected. For example, executives who like to dwell on potential gains in risky situations may react positively to risk-inducing incentives whilst executives who focus more on potential risks and threats may not be influenced by the same measure at all.[754] In a similar vein, executives who are already risk-seeking or like to engage

[750] See Frey (2002), p. 75.
[751] See Frey (2002), p. 76.
[752] See Wowack/Hambrick (2010), pp. 810-811.
[753] See MacCrimmon/Wehrung (1990).
[754] See Wowak/Hambrick (2010), p. 810.

in bold actions need to be incentivized in a different manner to their more risk-averse counterparts.[755]

Therefore, boards need to consider the characteristics of individual executives when designing the compensation systems. Depending on the executive's characteristics he will respond differently to different compensation elements. Consequently, properly designed compensation systems can also have a highly positive effect on an executive's motivation.

One possibility to at least obtain a certain insight into an executive's characteristics are personality assessments. As George and Jones put it, "[b]ecause personality is an important determinant of how a person thinks, feels, and behaves, it is helpful to distinguish between different types of personality."[756] Cohen and Swerdlik define the personality assessment as "[…] the measurement and evaluation of psychological traits, states, values, interests, attitudes, worldview, acculturation, personal identity, sense of humor, cognitive and behavioral styles, and/or related individual characteristics."[757]

There are several different models of personality (e.g. DiSC, Five Factor Model, Myers-Briggs type indicator, Competing Values Framework). While university faculties primarily administer the Five Factor Model, companies generally rely on the DiSC personality assessment.[758] Therefore, the next section will focus on the DiSC model as it has the following advantages: It is frequently used by organizations,[759] easy to administer and interpret,[760] and has been shown to be a good predictor of personality within the areas of employee retention and job success.[761]

5.7.6.2 The Types of Personalities based on DiSC®

The DiSC model is based on concepts developed by William Marston. He wanted to design a model that can account for human emotions and their different behavioral effects among people, and also how these behaviors change over time. His model is based on finding practical explanations to better understand the behavior of

755 See MacCrimmon/Wehrung (1990); Chatterjee/Hambrick (2007).
756 George/Jones (2012), p. 42.
757 Cohen/Swerdlik (2002), p. 324.
758 See Jones/Hartley (2013), p. 464.
759 See Reynierse et al. (2000), p. 3.
760 See Slowikowski (2005), p. 836.
761 See e.g. Deviney/Mills/Gerlich (2010).

individuals.[762] The resulting DiSC model measures surface traits to account for observed behavioral differences.[763]

There are four different types of personalities (see *Figure 14*) that are defined within the model and lend it its name: **D**ominant, **I**nfluencer, **S**teady, **C**onscientious. However, it is important to note that one should not see these four categories as being the only types of personalities that exist. Within the model, there are also combinations of personalities and behaviors: creative (dominant/influencer), driven (dominant/steady), goodwill (influencer/dominant), self-confident (influencer/conscientious), patient (steady/dominant), persistent (steady/conscientious), perfectionist (conscientious/influencer), and sensitive (conscientious/steady).[764]

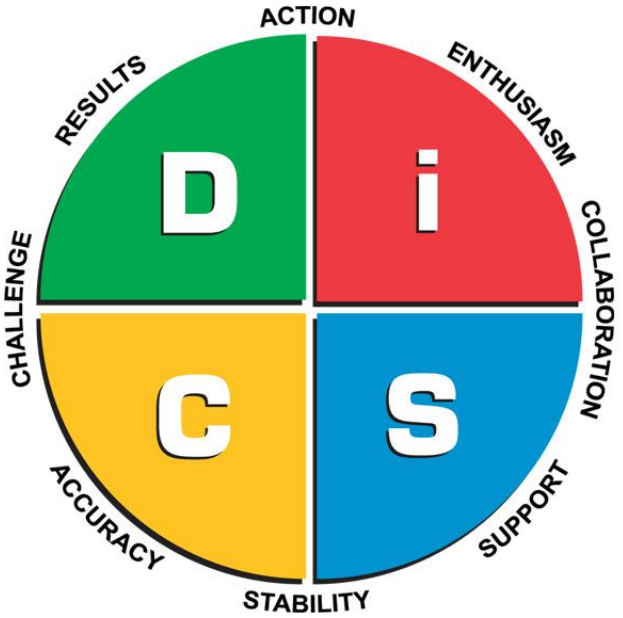

Figure 14: The DiSC Personalities and Their Core Attributes[765]

Despite these different combinations in personality, it is assumed that one of the four main personality types will stand out and constitute an individual's main personality.[766] Also, it has to be noted that certain subgroups in a population have a greater likelihood of representing a certain personality. For example, top executives within a company are highly likely to be characterized as dominant. However, in lower levels of management, the other three personality types will also be present. Therefore, it is

[762] See o.V. (1996), pp. 2-3.
[763] See o.V. (1996), p. 4.
[764] See Slowikowski (2005), p. 842.
[765] Graphic taken from o.V. (o.J.).
[766] See Turnasella (2002), p. 51.

imperative to analyze all four personality types to find suitable compensation systems, not only for top executives but also for lower-level managers.

The first personality type within the DiSC concept and, in all likelihood the one accorded the most interest, is the *dominant* type. Based on the DiSC concept, he is characterized by quick decision-making, high levels of initiative, and interactions that are seen as straightforward and result-oriented. He wants his individual performance to be rewarded and any perception he may have that his achievements are going unnoticed will severely decrease his motivation. A dominant person does not shy away from challenges or taking risks and is highly focused on obtaining results, especially when it comes to compensation elements. Herein lies the first problem that can be found: Due to the high focus on obtaining results, a dominant person will do everything to achieve as many performance goals as possible, no matter the circumstances or costs. This can either lead to certain goals being favored over others or an increased chance/possibility of manipulation. Furthermore, a dominant person can also be described as restless and impatient. One problem of this straightforward acting is found in rash and impatient decision-making, meaning only a short time is spent on gathering all possible information or alternatives.[767]

When it comes to the design of compensation systems for dominant personalities, the above-described characteristics and potential problems need to be considered thoroughly. First of all, if several performance goals are used, they have to be carefully designed so that there is no incentive to sacrifice one goal for another. Additionally, goals should be set as challenging but not to the extent that achieving them is close to impossible. For one, dominant persons relish the opportunity to prove their value and achieve recognition through the achievement of challenging goals. However, if these goals are overly challenging, dominant persons would have a high incentive to manipulate based on their high willingness to achieve performance goals. Their tendency towards rashness in decision-making also needs to be offset either by introducing penalties for poor decision-making or by introducing bonus-bank systems/averaging and long-term incentives. Furthermore, as a dominant individual demands the recognition of his individual performance, his compensation system should contain individual performance measures and not only focus on team goals. Both components are highly important as the individual performance measures provide the dominant person with

[767] See Turnasella (2002), pp. 50-51; Slowikowski (2005), p. 836.

feedback and recognition of his performance while the team goals induce him to co-operate and work well within the company.

The next personality type is the so-called *influencer*.[768] Based on the DiSC concept, he can be described as outgoing, apt at delegating, and optimistic. He will work well within the team and relies on social interaction to gain acceptance. Overall, he will try to create favorable working conditions. However, the influencer tends to shy away from unpleasant decisions. Also, he is described as being not particularly task-oriented.[769]

To account for the characteristics of an influencer person, compensation systems should rely heavily on team goals as an influencer performs best within a team. Goals and rewards should be designed in a way that prevents the influencer from shirking in critical or unpleasant situations. Additionally, to prevent him from procrastinating, goals and targets should contain strict deadlines. Furthermore, as influencers like to gain acceptance, Turnasella suggests the use of additional non-monetary rewards for performance like letters of recommendation and public displays of recognition.[770]

Next, the *steady* type can be described as technically competent and focused on tasks. Based on the DiSC concept, he places significant emphasis on team cooperation to complete a task. A steady person does not seek out challenges and prefers the status quo. He will seek out high levels of stability and security, and performance goals will be strictly followed. However, a steady person will also resist changes and new directions as regards his methods of working and overall compensation system orientation.[771]

Based on these characteristics, variable pay plans are not a good match with a steady person. Therefore, the ratio of fixed to variable pay should lean heavily towards fixed pay. As the steady type does not focus strongly on individual recognition, he does not need many individual performance targets and, therefore, performance goals and targets should be primarily team-oriented.

Finally, the fourth personality type is the *conscientious* type. He can be described as thorough, someone who thinks ahead, and a perfectionist. Based on the DiSC concept,

[768] This terminology should not be confused with the current commonly used term “influencer” in regards to social media personalities. Both are completely different and independent from one another.
[769] See Turnasella (2002), p. 51; Slowikowski (2005), p. 836.
[770] See Turnasella (2002), pp. 54-55.
[771] See Turnasella (2002), p. 51; Slowikowski (2005), p. 837.

he is highly focused on details, cautious, and tends to dwell on risky decisions. A conscientious person does not work well within a team and rather prefers to focus on his task by himself. However, he will not respond well to pay inequality amongst colleagues.[772]

Based on these characteristics, variable pay plans are difficult to administer for conscientious persons. For one, team goals are hard to implement as this type of person does not work well within a team. Additionally, as he tends to dwell on risky decisions and prefers to avoid them, variable bonuses may exacerbate this characteristic. Therefore, variable pay plans have to be extremely carefully administered for a conscientious type. Due to his high level of inequity aversion, pay plans should not differ significantly between colleagues. The given traits also raise the question of whether a conscientious person is really a good fit as a manager or executive. Here, instead of trying to design a compensation plan that works best for a conscientious manager, this type of person should rather be allocated to a detail-oriented job with precise instructions.

In sum, adjusting compensation systems to an individual's personality can be highly advantageous and may even provide a competitive advantage. However, it is best employed in conjunction with both national culture and company culture. Utilizing all three elements in a joined way can help to tailor a compensation system to the exact specifications of a certain manager within one's company. This will ultimately help to get the most out of each manager.

5.8 Recommendations for the Design of Management Compensation Systems

Based on the elements of focus of Chapter 5, namely bounded rationality, prospect theory, time preference aspects, motivation, inequity aversion, and personality and culture, behavioral economics provides several elements that need to be taken into account when designing of managerial compensation systems. This section serves to summarize the results of Sections 5.2 to 5.7 and lists a number of recommendations based on these results.

First and foremost, when designing compensation systems, it is important to consider that humans are not fully but only boundedly rational, as explained in Section 5.2. Consequently, making use of excessively complex mechanisms does not allow the

[772] See Turnasella (2002), p. 51; Slowikowski (2005), pp. 837-838.

compensation system to unfold its incentivizing function. As individuals often fall back on the intuitive System 1 of their thinking introduced in Kahneman's Two System Model from Section 5.2.2 and also form construed realities within their strategic decision-making as described in Section 5.2.3, compensation systems should not be designed in a complex and difficult-to-understand manner, instead they should be *simple and comprehensible*.

The design of compensation systems should not be generic but, as explained in Section 5.7, it should be done on both a more *individual and company basis*. Designing tailor-made compensation systems can help to harness the different characteristics of each company, each nationality as well as each personality and also prevents companies from falling into compensation traps that are innate to, e.g., different cultures. Of course, the design can also consider the *social norms* of the region. *Of highest importance is the corporate culture* since this sets the foundation for the use of all other elements of compensation.

Incentives used within a compensation system need to be constructed carefully. They should be utilized in such a way that the manager will *perceive the incentives as informing* and not as controlling. As Section 5.5.4 showed, incentives seen as overly controlling will lead to a reduction of intrinsic motivation and, consequently, a reduction of overall motivation. However, when incentives are mainly seen as informing, they tend to improve not only a manager's extrinsic motivation but also his intrinsic motivation.

A way to pronounce the informing character of incentives is through the *setting of specified targets* in incentive schemes, as shown in Section 5.5.5. Depending on a company's objectives, targets can be set on both an *individual and a team basis*. These targets then act as a yardstick for the manager and will motivate him as he strives for the target. When setting these targets, it is important that they are *challenging but still attainable* as overly simple or difficult targets will cause an adverse effect. Here, the recommended probability of achieving a goal is 80 to 90%. A compensation function based on the setting of targets would be similar to that presented in Section 3.5, which comprises a *challenging target but also an incentive zone around that target*. This incentive zone will ensure that a manager is still rewarded for his performance even if he was unable to reach the target or surpassed it.

Designing targets in a way that the manager will perceive them as part of a sequence can also help to enhance his motivation and, consequently, his performance as shown in Section 5.5.5.3. By *framing annual performance benchmarks as part of a larger plan* and *connecting them through a final, multi-year benchmark* the sequencing effect can be harnessed.

Dividing larger goals into sub goals can also make use of the sequencing effect and the motivational effect of goal proximity described in Section 5.5.6. Based on an individual's characteristics, larger goals should be divided into a certain number of sub goals depending on whether goal proximity or goal difficulty has a higher motivational effect on the individual manager.

The setting of performance targets should be done carefully and, additionally, *monitored and scrutinized* by a source that was not party to or, at least, had very little involvement in the process of setting the targets. Without proper scrutiny, managers and the board can fall into the trap of the optimism bias described in Section 5.5.5.2 and set overly difficult targets that will, when put into practice, only have a demotivating effect on the manager. An internal source would be preferable as outside sources can lack the necessary information and deep knowledge of a company to properly evaluate targets.

The overall level of *stock* within an executive's wealth building up as a consequence of share-matching plans or stock as long-term compensation element needs to be carefully monitored within compensation systems. They *should not constitute an overly large share of an executive's wealth*. If these compensation elements do constitute a large share, the danger of loss aversion is strongly pronounced, as shown in Section 5.3. Consequently, executives may act contrary to the interests of the shareholders, either to protect their current gains or to recuperate their losses.

Due to extremely high discount rates on the managerial side (Section 5.4) that are underestimated by the board, *long-term incentives need to pay out significantly higher levels* than those currently set in regular compensation systems to achieve the same incentivizing effect. Furthermore, the *time span between managerial decision-making and the resulting payout of the rewards should be made as short as possible*. Alternatively, attempts can also be made to reduce the myopic pressure that managers feel by *employing KPIs stemming from sustainability or systems like the balanced scorecard*.

Managers must be compensated *at least to the market level*. As Section 5.6 shows, inequity to the disadvantage of the manager has a very pronounced effect and will significantly reduce his motivation. Compensating a manager above the market level can send the signal that he is seen as being above average, feeding his need of proving his self-worth. However, it can also lead to a market-wide spiraling of management wages. This requirement can conflict with the requirement of more individual compensation structures. As a result, each company has to carefully consider which of the two requirements it deems more important.

6 Selected Potential Practical Problems

6.1 Introduction

This chapter addresses two aspects that may in practice lead to problems that are not incorporated into classical agency theory, preference similarity or behavioral economics. In order to establish a set of criteria for the design of management compensation systems, these problems should be analyzed and, if deemed significant, potential solutions should be incorporated into the recommendations of this work.

The first part of this chapter deals with the so-called "managerial power hypothesis" developed by Bebchuk, Fried, and Walker which postulates that the usually assumed "efficient contracting hypothesis" is not valid within the realm of CEO compensation setting. The authors offer an alternative hypothesis that builds on a CEO's potential influence over the board members that will set his pay.

The second part deals with a concept termed "career concerns", which postulates that managers who are in the early stages of their careers may sacrifice parts of their long-term compensation and take short-term action that is not in the interest of the shareholders. These short-term actions may not be beneficial to the company but they will send out signals as regards the good qualities of the manager. This is done with the intention of developing a reputation so as to earn a better-paid job in another company.

6.2 The Pay Setting Process

As seen in Section 4.2, agency theory predicts that a manager will have to at least receive his reservation utility which will prevent him from turning down the contract offered by the principal. Under the "efficient contracting hypothesis", it is assumed that board and manager will negotiate the contract at arm's length, which means that the solution they find will be as efficient as possible given the restrictions and constraints shown in Section 4.2.[773] This holds not only for the classical agency theory view but also for the concept of preference similarity. In these theories the board is supposed to act in the interest of the shareholders and, therefore, to negotiate a contract that is in their best interest.[774] However, Fama and later Fama and Jensen expressed doubts about the board's efficiency given their own potential self-interest.[775]

[773] See Bebchuk/Fried/Walker (2002), p. 764.
[774] See Bebchuk/Fried/Walker (2002), p. 764.
[775] See Fama (1980), pp. 293-294; Fama/Jensen (1983), pp. 313-315.

In their "managerial power hypothesis", Bebchuk, Walker, and Fried pick up these doubts and claim that the negotiation process between executives and board is not done at arm's length due to the influence of the executives on the pay-setting and also the board itself. They postulate that managers and especially CEOs will use their power to set their compensation as high as possible.[776] According to them, the only restriction to the compensation is the public perception which they term "public outrage".[777] This "public outrage" will set limits on the compensation as the public may become upset by pay packages that are beyond any justifiable limit. An outrage that is widespread and intense will, therefore, put a natural limit on executive compensation as the authors argue.[778] However, the concept of "public outrage" has been criticized for its lack of precision.[779] Nevertheless, the "managerial power" theory was picked up by other authors and subsequently employed to criticize the adequacy of current executive payment structures. As Paul Krugman states, "[t]he key reason executives are paid so much now is that they appoint the members of the corporate board that determines their compensation and control many of the perks that board members count on. So, it's not the invisible hand of the market that leads to those monumental executive incomes; it's the invisible handshake in the boardroom."[780]

Especially in the United States, recommendations regarding high-level pay structures and pay levels are made by the human resource department of a company, often in union with compensation consultants. The recommendations are subsequently submitted to the top managers who will then have the choice of either approving the suggestions or returning them for revision.[781] This is already pointed out as a first weakness, as most remuneration committees do not undertake market studies on the pay levels of competitors or their pay structures.[782] It is important to note that no top manager has any say in his own compensation but can only approve suggestions made by the human resource department as concerns other executives. The second weakness of this procedure is the fact that the suggestions regarding the compensation structure are made by internal employees (the human resource department). This is seen as a problem and Jensen, Murphy, and Wruck claim that this calls the integrity of the whole pay-setting

[776] See Bebchuk/Fried/Walker (2002), pp. 766-767.
[777] See Bebchuk/Fried/Walker (2002), p. 786.
[778] See Bebchuk/Fried/Walker (2002), p. 786.
[779] See Weisbach (2006), p. 7.
[780] Krugman (2005), p. 13.
[781] See Jensen/Murphy/Wruck (2004), pp. 50-51.
[782] See Jensen/Murphy/Wruck (2004), pp. 50-51.

process into question.[783]

Furthermore, Morse, Nada, and Seru claim that a top manager and especially the CEO is able to influence the board in this pay-setting process so that it will select performance measures which will emphasize categories that he deems as especially fruitful and ignore those that the CEO believes will not do well. He will, therefore, exert his influence to skew the compensation system in the direction of performance measures that he can more easily influence positively.[784] This behavior would run counter to the interest of the shareholders as the manager should incorporate all areas of a company into his decision-making and not only those that allow him to reap the highest profit for himself. An example to underline this hypothesis is given by Morse, Nada, and Seru, who take the example of Robert Nardelli, the former CEO of Home Depot:[785] At first, his long-term incentive pay linked his performance to that of an index of competitors. As the share price of Home Depot became worse than that of the competitors his compensation structure was subsequently changed. Then, his long-term incentive pay was only dependent on "[…] specified levels of average diluted earnings per share […]",[786] which made his performance look better than under the old conditions. The authors use this example to claim that the "managerial power hypothesis" holds in practice and that assumptions made by the classical contracting literature underestimated the power of top management on its own pay structure. This theory was corroborated by the findings of Abernethy, Kuang, and Qin who found that powerful CEOs were able to influence the choice of performance targets which, as a consequence, reduce the benefits of performance-based compensation.[787]

The next question, then, is how exactly the top management can influence the board with regard to the pay-setting process. Bebchuk, Fried, and Walker claim that CEOs dominate the director nomination process by using their power and influence to bias the appointment and also reappointment of independent directors. Together with other authors like Baysinger and Butler, they maintain that the CEO will guide the nomination process in the direction of the weakest candidates that are highly likely to succumb to his influence and power.[788] These newly appointed directors are highly unlikely to

[783] See Jensen/Murphy/Wruck (2004), pp. 50-51.
[784] See Morse/Nanda/Seru (2011), pp. 1779-1780.
[785] See Morse/Nanda/Seru (2011), p. 1780.
[786] Morse/Nanda/Seru (2011), p. 1780.
[787] See Abernethy/Kuang/Qin (2015).
[788] See Baysinger/Butler (1985), p. 102; Moldoveanu/Martin (2001), pp. 11-12; Bebchuk/Fried/Walker (2002), pp. 766-767.

confront the CEO as regards his pay structure. Bhagat and Black consequently characterize independent directors as "[…] lapdogs rather than watchdogs […],"[789] while Bebchuk, Fried, and Walker assume that these types of directors rather want to focus on policy matters than challenging a top manager in an area where "[…] they are not as knowledgeable […]."[790] Additionally, it is also claimed that board members appointed during the reign of a CEO will be grateful for their appointment and will, thus, advocate higher pay levels for him.[791] Belliveau, O'Reilly, and Wade second this, finding that compensation committee chairmen appointed during the reign of a CEO will award him higher compensation than those appointed previously.[792]

However, it is not only top management's influence on the board of directors that is said to be blamed for unnecessarily high executive compensation. Indeed, the presence of other CEOs on the boards and the lack of economic incentives for withstanding the influence and pressure of top management attempting to gain a higher payment are also put forward as factors. For one, outside CEOs may be incentivized to advocate higher payments as this will increase the average CEO compensation which they can, subsequently, use in their next contract negotiation.[793] For another, not properly incentivizing board members through proper pay structures can also reduce their incentive to withstand the pressure of the CEO. As both Hartzell and Stark, and Bertrand and Mullainathan found, high levels of stock ownership within the board of directors can significantly reduce the pay levels of the top management of a company and also promotes a stronger link of pay to performance.[794] Board members with a financial interest in the company will have bigger incentives to properly monitor executive behavior and behave in the interest of the shareholders given that, with stock ownership they are also now shareholders.

Based on the vast range of ideas emanating from the managerial power theory, Sun, Cahan, and Emmanuel found a set of conditions that would allow for the strengthening of the pay-for-performance principle. For them, an optimal compensation committee consists of only a few members appointed by the current CEO and, therefore, rather

789 Bhagat/Black (1999), p. 4.
790 Bebchuk/Fried/Walker (2002), p. 768.
791 See Bebchuk/Fried/Walker (2002), p. 768.
792 See Belliveau/O'Reilly/Wade (1996); Bebchuk/Fried/Walker (2002), p. 768.
793 See Bebchuk/Fried/Walker (2002), p. 768.
794 See Bertrand/Mullainathan (2001), p. 903; Hartzell/Starks (2003).

comprises members with a long tenure on the committee.[795] The board members should be incentivized by including stock ownership in their payment structures. Furthermore, there should be as few as possible CEOs from other companies and members with other directorships on the board. Strengthening corporate governance by allowing for a higher level of board independence and stronger monitoring are the keys to recuperating a proper level of pay-for-performance according to the authors.[796] Moreover, Stout emphasizes the importance of good board control in board members with "[…] a modest personal interest in ensuring the company's success and (perhaps more importantly) no strong financial interest in trying to expropriate wealth from other participants."[797]

In saying this, it should be remembered that the theory of managerial power has not been without significant criticism, and that studies that do criticize also make use of empirical evidence that contradicts many statements made within the theory.

First of all, critics point towards the simultaneous occurrence of increased board independence and increased CEO pay during the 1990s. This runs counter to the hypothesis made by Bebchuk, Fried, and Walker that CEO pay levels should have decreased under this development.[798]

Second, evidence of the increase of pay levels, especially of externally hired CEOs compared to that of internal candidates,[799] the shortening of CEO tenures over time as well as aggregate-level associations between corporate performance and compensation are all used by critics to claim that managerial power theory is not supported by empirical evidence.[800] Due to this empirical evidence used by critics, the validity of the managerial power concept remains doubtful.[801]

Overall, it can be concluded that the concept is a disputed one. Yet at the same time it is held that, independent of the theory's validity, the potential remedies the proponents of the theory reference are generally helpful as concerns the safeguarding of proper

[795] This condition is difficult to uphold once the CEO has a very long tenure or there is the necessity of a large substitution of board members due to age or other factors. Consequently, this suggestion cannot be fulfilled under every circumstance, but a high share of directors appointed during the current CEO's term can be used as an indication to closely scrutinize the pay-setting process.

[796] See Sun/Cahan/Emanuel (2009), pp. 1509-1510, 1517-1518.

[797] Stout (2007), p. 798.

[798] See Murphy (2002), p. 852; Hall/Murphy (2003), pp. 64-65; Murphy/Zábojník (2004), p. 192; Conyon (2006), p. 40.

[799] This would mean that internally appointed CEOs would not have as much power of the board than proclaimed by managerial power theory.

[800] See Murphy (2002), pp. 852-854; Hall/Murphy (2003), pp. 64-65; Murphy/Zábojník (2004), pp. 192-193; Kaplan (2008), pp. 5-6.

[801] See O'Reilly/Main (2010), p. 700.

pay packages for managers and should, therefore, be heeded and integrated into compensation systems.

6.3 Career Concerns

The idea of "career concerns" was expressed by Winter, who theorizes about contract situations where the actions of the agent not only influence his current employer but also have an effect on his future job offers.[802] This idea is based on the possibility that an agent's actions will act as a signal to the labor market and can, therefore, help him to build up his reputation. These signals will be especially important due to the problem of hidden characteristics and the chances of revealing one's quality through the performance on the current job.[803] As described in Section 2.4.2.1, the labor market is one of the most important corporate governance mechanisms as the signals an agent sends to the market will have a fundamental effect on his future job offers and the payment packages he will receive from other companies. Thus, the agent may not only consider his current contract situation when making decisions but may also base his decision-making on future career chances.[804] He may even go as far as to choose only those investment projects and strategic decisions that increase his own reputation but are harmful, i.e. value-destroying, for the shareholders—especially in the long run. Examples named by Winter are the omission of investments that cannot be activated such as marketing campaigns or employee training. While this will surely increase short-term profits, it will also reduce the discounted cash flow as both of the mentioned examples have a pronounced long-term effect that cannot be capitalized on in the short-term.[805] Due to the fact that the profits of the company are often used as a base to evaluate the qualities of a manager, Winter argues that a manager that wishes to climb the career ladder as quickly as possible considers not only his current compensation but also incorporates the additional earnings he would expect to gain if he changed his job. If this evaluation indicates to him that the additional gains through the change of the job are higher than the long-term losses in his compensation (or even the later punishment of bad behavior), then he will act as described in the examples and, thus, cause financial disadvantages for the shareholders.[806]

[802] See Winter (2001), p. 496.
[803] See Winter (2001), pp. 497-498.
[804] See Winter (2001), pp. 496-497.
[805] See Winter (2001), pp. 498-499.
[806] See Winter (2001), pp. 498-499.

In the case of "career concerns", the mere consideration of the contractual relationship between the agent and his current principal for the design of the contract is not sufficient to properly design a compensation system that will incentivize the agent to act in the interest of the shareholders.[807] One has to distinguish several types of agents and their very different behavior regarding career concerns: The build-up of reputation is especially important for younger managers as they, for one, have not as yet been able to develop a large reputation and, for another, will profit from their behavior for a longer period of time. This leads Winter, and Gibbons and Murphy, to suggest that younger managers may need lower levels of incentive payment as they already have the incentive to build up their reputation. Older managers, on the other hand, would need higher levels of incentive payment as their "career concerns" are no longer as pronounced, meaning they would need to be motivated by other means.[808] This however also indicates that younger managers could be more prone to manipulation, which means that measures to reduce or eliminate fraudulent behavior should be more accentuated within their compensation systems compared to those of older managers.

Overall, the theory about "career concerns" is very intriguing as it not only looks at the current contract situation but also potential conflicts of interest between manager and shareholder that can occur due to the market for managers. However, the concept remains somewhat ambiguous when it comes to suggestions on the design of compensation systems based on the age or tenure of a manager. Nevertheless, the base idea is still valuable when combining it with the more personalized compensation systems discussed in Chapter 5.

6.4 Recommendations for the Design of Management Compensation Systems

By analyzing the potential problems of performance-based compensation systems it becomes evident that the *board of directors* is an important part of this which cannot be neglected. The board of directors should also be *compensated on a value-based level*, e.g. through restricted stock.[809]

Furthermore, the potential influence of a high-ranking executive on the remuneration committee leads to the following recommendations regarding the *structure of the board*: First, the *overall number of outside CEOs or executives* sitting on the board

[807] See Winter (2001), pp. 497-498.
[808] See Gibbons/Murphy (1992), p. 470; Winter (2001), p. 499.
[809] For an in-depth analysis of the compensation of the board of directors see: Ortner (2017).

should be *minimized* to prevent reciprocal behavior in pay-setting which is to the disadvantage of shareholders. Second, the *number of board members with multiple directorships/board seats* should also be *restricted*. Finally, and most importantly, the environment of the board should be changed in a way that the directors do not see themselves as dependent on the CEO. Here, it is the *social structure* in particular that needs to be *adjusted*. For example, it is best when *as few as possible directors* are on the board that were *appointed during the reign of the current CEO*.

7 Conclusion and Outlook

Due to the increasing complexity of companies and their increasingly dispersed ownership, separation of ownership and control is necessary. The control is delegated to external managers who are better qualified for the job than the owners and are supposed to act in their interest. However, there is a high potential for a conflict of interest as the owners are interested in maximizing a company's value whereas the managers want to maximize their own utility. To achieve the company's target in spite of this conflict of interest, corporate governance is installed. This has the aim of ensuring that the company's target is achieved. The present study focused on the shareholder value concept which defines the target of a company as the maximization of the intrinsic value of a company's equity. Even though there is a variety of corporate governance tools, it became evident that result controls through the use of incentive systems are the most viable option to ameliorate the conflict of interest.

It was shown that there are different types of incentives that can be used. However, due to its universal use and practicality, this thesis focused on monetary financial rewards and incentive systems. The latter are complex constructs whose different elements, namely its assessment basis, the types of compensation used, and the compensation function need to be properly designed to achieve the desired effects. This thesis presented several requirements for compensation systems and, alongside the more elementary needs, there were of course those which were also more specific. It was also shown that, due to the complexity of a manager's job and the vast number of tasks he has to do, the concept of preference similarity is especially useful. Consequently, this thesis focused on designing management compensation systems in a preference-similar manner by describing the requirements necessary for preference-similar performance measures and by evaluating possible apt measures. Thereafter, recommendations for the design of management compensation systems in a preference-similar approach were set.

However, due to the controversial debate regarding the compensation of executives as detailed in the Introduction, it was also necessary to examine the effectiveness of compensation systems via analysis of a vast amount of empirical research. Here, it became evident that due to ambiguous empirical results and harsh criticism of the base concept of agency theory, further concepts that enhance the human aspect of agency theory were required.

For this reason, the focus of this thesis then shifted to behavioral economics, a concept which seeks to introduce psychological findings into economic models. As a result, its proponents attempt to improve predictions of individual/managerial behavior which can consequently also lead to better recommendations for practice. In this work, the focus was on the elements of bounded rationality, prospect theory, hyperbolic discounting and other time preference aspects, motivational aspects such as intrinsic motivation and goal setting, inequity aversion, and cultures and personality. By analyzing these different concepts and aspects it became evident that behavioral economics can indeed contribute to the discussion and is in a position to extend the recommendations made. In particular, a higher focus on different national cultures and intrinsic motivation were found to be important elements. Furthermore, the single elements were also able to corroborate recommendations made from preference similarity by providing them with a different explanation and, thus, giving them a more solid underpinning.

Alongside the findings of behavioral economics, this thesis also introduced potential practical problems discussed in the compensation literature. Specifically, it was found that the problems surrounding the pay-setting process were able to enrich the recommendations made by not only placing the focus on the manager himself but also by looking at the problems that surround those responsible for setting his payment.

Overall, this thesis provided a comprehensive list of recommendations that can be made on management compensation systems. However, as these recommendations were made in different chapters with different theoretical underpinnings, it is important now to combine them so as to achieve a comprehensive overview, which is also the main objective of this work:

1. The compensation system must be *simple*, *comprehensible*, and *transparent*. If it is not transparent, the chances are that it will not be accepted. Simplicity and comprehensibility are of equal importance as a human being is only boundedly rational and overly complex systems can cause him to make intuitive, and possibly faulty decisions by falling back on the use of System 1 and the construed realities he will create in strategic decision-making.
2. A compensation system should be designed in a *flexible* manner, one which allows the company to react to changes in its environment or the overall economy. This will ensure that compensation systems continue to incentivize and motivate managers under changed circumstances.

3. The design of compensation systems should not be generic but instead should be done on both a more *individual and company basis*. Designing tailor-made compensation systems can help to harness the different characteristics of each company, each nationality as well as each personality and also prevents companies from falling into compensation traps that are innate to, e.g., different cultures. *Of highest importance is the corporate culture* since this sets the foundation for the use of all other elements of compensation. The specific consequences for the cultural dimensions can be found in Section 5.7.
4. One can also more specifically *incorporate the social norms of the region* in which the company finds itself, a *company's culture*, and the *personality of the manager* into the compensation system. Just like the national culture, these elements will modify the accentuation of the single elements within the compensation system. However, these adjustments can also foster feelings of inequity. Consequently, each company must decide whether or not the benefits of using more individual compensation systems outweigh the drawbacks of potential inequitable pay.
5. Managers should be *compensated at the market level or above it*. Failing to compensate them at the market level will significantly reduce their motivation due to feelings of inequity while compensation above the market level helps to underline their self-worth, thus increasing their motivation.
6. Compensation systems should be designed in a *preference-similar* manner. Both the assessment basis and the compensation function of the variable compensation need to be preference similar.
7. For the *assessment basis* to be preference similar it needs to fulfill the principle of *net present value identity*. Therefore, only *cash flow*, *residual income*, or the *share price* are recommended as an assessment basis.
8. When using *residual income* as an assessment basis, the concept used should calculate its *capital charge based on a risk-free interest rate* and should only allow for *adjustments that adhere to the clean surplus condition*. One concept that fulfills these requirements is the "Earnings less riskfree Interest Charge" (ERIC).
9. In the realm of the share price, *stock options* should not be used as a performance measure as they can never be preference similar. Instead, for a per-period performance measure the *residual share price* is recommend which, to filter out market movements, *should be indexed against the market or a basket*

of competitors.

Furthermore, *using stock as a long-term compensation component is recommend*. However, this *requires a vesting period* and *unwinding constraints*.

10. The incentive for executives to *buy company shares through share-matching plans* is highly recommended.
11. The *use of several types of assessment bases* is recommended. Using residual income and the share price makes it possible to incentivize the manager in a larger area of his decision-making and can also help to partially shield him from developments in the share price that he cannot control. Furthermore, residual income has a stronger focus on the past while the share price is more future-oriented, thus, covering a wider base.
12. *The holding of company stock should not constitute an overly large share of an executive's wealth.* Otherwise, the danger of loss aversion is strongly pronounced and can lead to misincentives.
13. Due to extremely high discount rates on the managerial side that are often underestimated, long-term incentives need to pay out significantly higher levels than those currently in place so as to achieve the intended net present value and thus the intended incentivizing effect. Additionally, the *time span between a managerial decision and the resulting payout of the reward should be kept as short as possible*.

    The myopic behavior of managers can alternatively be tackled by *utilizing sustainability KPIs or KPIs coming from systems like the balanced scorecard.*
14. The *compensation function* used should be designed *in as linear a manner as possible* and at best should prevent the use of caps and floors. As floors within residual-income compensation function cannot be eliminated due to limitations of liability, caps should also be included to prevent an asymmetry of risk in the compensation function. However, the *incentive zone should be set as wide as possible*.

    To allow for a certain degree of participation in financial disadvantages and to allow for the smoothing of the managerial compensation, *bonus banks can be used which however need to be interest-bearing*. Alternatively, the *manager's compensation could be based on a multi-year average of the assessment basis* (three years are recommended).
15. *Incentives set should be perceived as informing* and not as controlling. Informing incentives can improve both extrinsic and intrinsic motivation.

16. *Informing incentives can be provided through the setting of specified targets*. These targets should be challenging but still attainable. The probability of achieving them should be around 80 to 90%. These targets should be included in the compensation function.
17. *Targets* should be designed in a way that the manager will *perceive them as part of a sequence*, thus, increasing his motivation. This could be achieved by *framing annual performance benchmarks as part of a larger plan* and by *connecting them through a final, multi-year benchmark*.
18. *Large goals should be divided into sub goals*. This can harness the motivational effects of sequencing, goal difficulty, and goal proximity. Depending on a manager's personality and the consequently different motivational effects of goal proximity and goal difficulty, the difficulty and frequency of sub goals should be chosen.
19. The setting of performance targets must be monitored and scrutinized by a source that was not party to or at least had little involvement in the process of setting the targets. This can prevent the setting of overly ambitious targets caused by the optimism effect.
20. Introducing *claw back clauses* into the compensation system can reduce the incentive for manipulation. However, the implementation of a claw back clause can be difficult as it may reduce the acceptance of a compensation contract.
21. To prevent potential problems of executive power in the pay-setting process, the *board of directors or the Aufsichtsrat should also be compensated on a value-based level*.

    Moreover, the *number of outside CEOs or executives on the board as well as the number of board members with multiple directorships/board seats should be minimized*. Additionally, there should be *as few as possible directors on the board that were appointed during the reign of the current CEO*.

All in all, this thesis was able to provide a richer understanding of managerial behavior by adding elements stemming from behavioral economics to the discussion. Furthermore, it expanded the picture of management compensation by combining agency-theoretical ideas with those elements of behavioral economics. This was further reinforced by introducing additional aspects that need special consideration such as the highly important elements of national culture, company culture, and personality. Especially company and national culture are of the utmost importance if one wants to succeed within a specific country. Via the connection of agency-theoretical concepts

and behavioral economics, further insights into the recommendations for managerial compensation were gained. To the knowledge of the author, a list of recommendations based on the combination of the two concepts has not been done before. Consequently, this thesis was able to provide an important scientific contribution through its comprehensive overview of the design of management compensation which also strives for guidelines that can be properly enacted in practice. Also, the pronunciation of the importance of designing the structure of the board of directors the right way for a proper enactment of these compensation guidelines further rounded off the picture.

Of course, that is not to say that there are not further topics of research that could enrich the field of management compensation. For one, although this thesis examined company culture, it did not look into different types of companies (e.g. start-ups). Depending on the type of company, influencing company culture through the compensation system can be a fruitful field for research as adapting the culture to the specific requirements of the company's environment could harness positive effects.
Furthermore, many of the behavioral aspects mentioned in this thesis have only been proven in the laboratory or based on simple tasks in reality. This may potentially limit the significance of recommendations made based on these aspects (e.g. goal setting). Here, further experiments and further empirical research within the realm of managerial activities are necessary to prove that these behavioral aspects can also be transferred to managerial activities without significantly changing their message.
Moreover, the concept of career concerns could also enrich the recommendations made by exploring how exactly the different personalities presented in the DiSC model might behave under this idea.

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