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The social-psychological perspective on executive compensation: evidence from a two-tier board system

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Abstract

This paper investigates whether and how social-psychological mechanisms, namely reciprocity, demographic similarity, and similar experiences, affect CEO compensation packages with respect to the levels of total, fixed, and short- and mid-term compensation and the variable proportion of the compensation package. We use evidence from Germany as it is considered a prototype of a two-tier board system. Given the primary roles of both the CEO and the chair of the supervisory board, we especially highlight social-psychological mechanisms in the process leading to the final compensation package. Using a hand-collected sample of non-financial constituents of the German HDAX, we find that reciprocity can lead to a compensation package that is more favorable for the CEO. Results on similarity are ambivalent such that the effects of similarity on CEO compensation—both positive and negative—may depend on the dimension of similarity. Finally, the chair's CEO experience, both inside and outside the focal company, also plays an essential role in shaping CEO compensation. More specifically, CEO experience in general is associated with more favorable compensation. However, having a chair that has been CEO at the focal company correlates with less favorable compensation packages except for when the CEO has also been recruited internally.

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1 Introduction

The general idea behind executive compensation is that compensation should incentivize the CEO to work in the firm's and its shareholders' interest (O'Reilly III and Main 2007). As executive pay takes over a control function with regard to CEO's behavior, firms have to carefully consider how to design CEO compensation since it determines whether the CEO behaves as desired. Hence, CEO compensation and its structure attracted not only the public's interest but also great attention in research and have been discussed intensively over the last decades (Gomez-Mejia and Wiseman 1997; van Essen et al. 2015). However, it is still not conclusively clear which specific factors play a role in determining CEO compensation and may even bias the determination process. Besides investigations on how firm characteristics such as firm performance or firm size determine CEO compensation (Boyd 1994; Hall and Liebmann 1998; Jensen and Murphy 1990b), a second stream of research analyzed the influence of individuals on the CEO's compensation package (Finkelstein and Hambrick 1996). CEOs themselves usually negotiate executive compensation with at least one board member or a specific committee. Although the determination process is difficult to comprehend from the outside and therefore commonly considered a "black box" (Barkema and Pennings 1998; Bültel 2011; O'Reilly III and Main 2010; Tosi and Gomez-Mejia 1989), recent literature has focused on the role of these negotiators and the mechanisms underlying the determination process. Specifically, this research stream brought up three perspectives described by Finkelstein and Hambrick (1996) as the economic, the political, and the social-psychological perspective. The vast majority of studies focused on the first two perspectives, analyzing CEO compensation in the context of agency theory and managerialism (economic perspective) and managerial power theory (political perspective). However, especially the economic perspective has not been able to fully explain executive compensation's determination (Bruce et al. 2005; Rapp and Wolff 2010; Schmidt and Schwalbach 2007; Tosi et al. 2000). Consequently, a social-psychological perspective emerged that focuses on relationships between negotiating parties and considers mechanisms like reciprocity and social influences via similarity and social comparison. However, until today, only a few studies exploited this perspective, although it has the potential to provide further insights into the determination process (e.g., Fiss 2006; Main et al. 1995; O'Reilly III et al. 1988; Uepping 2015; Westphal and Zajac 1995).

Contributing to this research perspective, we investigate the effects of such social-psychological mechanisms on CEO compensation to better understand how executive compensation is determined. More precisely, we use the German setting that allows us to observe relevant characteristics of the two dominant players in the pay-determination process, namely the CEO and the chair of the supervisory board. Until now, the major body of literature on CEO compensation has focused on Anglo-American countries where one-tier board structures prevail. In such a corporate governance system, there is only one board—the board of directors—which is responsible for managing and supervising the company. It consists

of executive and non-executive directors who can be represented by inside directors, such as the CEO, and firm outsiders. The CEO compensation is determined by members of the board of directors or, more and more commonly, by members of a special compensation committee. In contrast, Germany is an example of a country with a two-tier corporate governance structure, where most of the large companies operate as stock corporations (Aktiengesellschaften) and have a supervisory board (Aufsichtsrat) and an executive board (Vorstand) with mutually exclusive memberships (Elston and Goldberg 2003). Both the CEO as chair of the executive board and the chair of the supervisory board have a de facto dominant role within their boards (Oesterle 2003).[1] As such, even though the entire supervisory board or a special compensation committee might be responsible, the chair most likely has a strong influence on CEO compensation. Moreover, a close exchange between CEO and chair suggests that the CEO can influence the chair's views (Fiss 2006). Hence, the German setting enables us to distinctly attribute the effect of social-psychological mechanisms to these two players instead of a whole group of directors.

For the German setting, only Fiss (2006) demonstrates that demographic factors of both the CEO and the chair of the supervisory board strongly influence the compensation of the top management team (TMT). To extend these initial findings from a social-psychological perspective, we investigate the relationship between the CEO and the chair of the supervisory board and its impact on CEO (instead of TMT) total compensation, CEO fixed compensation, CEO short- and mid-term compensation, and the proportion of variable compensation. Thereby, we focus on social-psychological mechanisms. Specifically, we examine reciprocity and similarities with regard to personal and educational demographics and role experiences.

Using a hand-collected sample of non-financial constituents of the German HDAX, we find that reciprocity, demographic similarity, and the chair's similar experiences as CEO play a significant role in shaping CEO compensation packages. Concerning reciprocity, the chair's excess compensation is positively associated with total compensation and short- and mid-term compensation of the CEO but also the share of variable pay. Moreover, a longer tenure of the CEO compared to the chair is positively associated with fixed CEO compensation. Similarity in age between the two actors negatively relates to total and fixed pay and is positively associated with the share of short- and mid-term incentives. Moreover, similarity in nationality is associated with less fixed pay and an increase share of short- and mid-term incentives. In contrast to this, similarity in educational degree does not affect the total compensation. However, it relates to less performance-dependence the share of variable compensation is negatively related with similarity in educational degree. Additionally, we find that chairs with experience as CEO at either another company or the focal company are associated with higher total compensation but also a higher share of variable compensation. An additional analysis that differentiates between CEO experiences in the focal and another company shows

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[1] In the following, we use the expressions CEO and chair (of the supervisory board) to refer to the positions of the "Vorstandsvorsitzender" (chair of the executive board) and the "Aufsichtsratsvorsitzender" (chair of the supervisory board).

a similar pattern when the chair has outside CEO experience. In contrast, chairs who have worked as CEO at the focal company relate to less favorable compensation packages except when the CEO has been recruited internally. Finally, in another additional analysis, we find that ownership control does not mitigate the effects of reciprocity and similarity.

Our study contributes to the literature in several ways. First, contrary to previous studies, we focus on the social-psychological perspective of CEO compensation. This perspective allows us to take into account that compensation determination is an ambiguous task that relationships between key actors can strongly influence. Hence, we consider various explanations with regard to social-psychological mechanisms. That way, we can better understand and gain additional knowledge about the importance of the social-psychological perspective.

Second, as distinct from a few (German) investigations in this context, we can shed light on mechanisms in the pay-determination process instead of merely analyzing its results. This analysis is possible due to a legal change in Germany's compensation disclosure, making the compensation structure transparent for individual members of the executive board. Since this change, we have been first to highlight the two-tier system's characteristics against this approach's background to the best of our knowledge. Importantly, through investigating the individual components of CEO compensation, we gain profound insights that help to bridge ambiguous results of prior studies and render some previous evidence far less absolute.

Third, we follow the call by Beck et al. (2020) for more research on executive compensation with international data, given the conclusion that their empirical results for German data at least partly diverge from results for U.S. data. By focusing on the German two-tier board system with clearly separated responsibilities, we can provide further insight into the mechanisms of the negotiation process of CEO compensation, which would be extremely challenging to investigate among one-tier systems. However, our results are also relevant for and transferrable to one-tier systems. For example, in the U.S., the number of firms in which the CEO also takes over the role of the chair of the board (CEO duality) is declining, and firm outsiders have been appointed as chairs more often (Abels and Martelli 2013). That means, although one-tier board structures are predominant, the decision-making process regarding CEO compensation starts to converge with the German system (Gilson 2001). Specifically, compensation committees whose responsibilities are functionally separated and declining CEO duality reflect the rapprochement between the one- and the two-tier system and indicate an increasing comparability (Conyon and He 2004; Fiss 2006).

The remainder of this paper proceeds as follows. At first, Sect. 2 provides background information, discusses prior literature, and presents the hypothesis development. Section 3 sets forth the study design. Section 4 presents the results, and Sect. 5 concludes.

2 Background and hypothesis development

2.1 Executive compensation in Germany

As the negotiation process for CEO compensation in German companies is mainly influenced by two actors, we first describe the corresponding roles and remits of both the CEO and the chair of the supervisory board. In any case, their close relationship underlines the importance of applying a social-psychological perspective to analyze the determinants of the CEO's compensation package.

In German companies, the supervisory board's responsibilities include selecting and appointing the members of the executive board. Moreover, the supervisory board determines the executive board's compensation. Members of the supervisory board may form a compensation committee, which the chair of the supervisory board typically leads. The compensation committee was able to determine the executive compensation autonomously until 2009. Today, after a legal change, all members of the supervisory board must decide on the executive board's compensation. However, the compensation committee may still prepare a proposal.

The CEO de facto has special privileges—although not regulated by law. First, he may influence the decision-making process through the flow of information within the executive board. Second, he is supposed to maintain close contact with the chair of the supervisory board to discuss strategy, planning, business development, the risk situation, risk management, and compliance (German Corporate Governance Code Commission 2019). In practice, this close contact strengthens the relationship between the CEO and the chair and is likely to weaken the position of ordinary members of both boards (Fiss 2006). Although the entire supervisory board is supposed to discuss the CEO compensation, the CEO and the chair are expected to play crucial roles in the determination process. Thus, social-psychological aspects of the relationship between the CEO and the chair of the supervisory board are particularly interesting for the negotiation process and should therefore be investigated with respect to executive compensation. Since, in Germany, the specific roles of both the CEO and the chair of the supervisory board are regulated by law, the German corporate governance system is an adequate basis for exploring the determination process of the CEO compensation, and thus allows us to collect information on the two key players in the process and gain insight into their relationship and resulting influences on compensation.

2.2 Social-psychological mechanisms and CEO compensation

Early research on executive compensation focuses on economic perspectives, primarily based on agency theory, managerialism, and human capital theory (Brockman et al. 2016; Finkelstein and Boyd 1998; Hambrick and Finkelstein 1995; Jensen and Murphy 1990a; Murphy 1999). For example, from an agency theory perspective, CEO compensation is mainly considered a matter of formal contracting that reflects a pay-for-performance relationship (Finkelstein and Hambrick 1988).

However, despite extensive investigations, economic theories cannot provide a comprehensive explanation of the drivers of CEO compensation and the process of its determination (Tosi et al. 2000). As a result, Tosi et al. (2000, p. 331) conclude in their meta-analysis of economic studies on CEO compensation that "there is a large unexplained variance in CEO pay."

Against the background of these findings from the economic perspectives, other studies argue that the determination of CEO pay is a very ambiguous task due to the different components of CEO pay and different interpretations and expectations of CEO behavior (Finkelstein and Hambrick 1988; Main et al. 1995). This ambiguity leaves room for political plays and for social-psychological mechanisms to unfold. Concerning a political perspective, it is argued that CEOs are using their power over the board to influence the directors' decision-making regarding CEO compensation (Finkelstein and Hambrick 1989; Hambrick and Finkelstein 1995; O'Reilly III et al. 1988). One line of research at the intersection of the political perspective and the social-psychological perspective investigates how powerful CEOs indirectly influence their compensation by selecting new (outside) directors of the board who would act in the CEOs' interest. For example, O'Reilly III et al. (1988) represents an Anglo-American study that investigates the impact of social comparison on CEO compensation. The authors argue that CEOs typically have the power to select new members of the board of directors. Thereby, they may rely on social comparison mechanisms and select outside directors who are CEOs themselves and refer to their own compensation when deciding on the other CEOs' compensation. Consequently, O'Reilly III et al. (1988) find that outside directors' salary levels are positively associated with CEO compensation, an indicator for social comparison processes.

Based on a similar reasoning, Westphal and Zajac (1995) investigate the effect of powerful CEOs more directly. They argue that CEOs generally prefer new directors who are demographically similar to them because those directors tend to review CEO performance less critically, positively affecting performance-contingent compensation and CEO compensation in total. However, CEOs must have the power over the board to select new directors for this mechanism to work. Consequently, Westphal and Zajac (1995) find a positive association between powerful CEOs and the similarity between CEOs and new directors. Moreover, high levels of similarity are associated with more generous CEO compensation contracts.

While these studies act as a first indicator for the relevance of political and social-psychological aspects to explain the drivers of CEO compensation, O'Reilly III and Main (2010) claim that it is crucial to learn more about the explicit mechanisms by which CEOs may use their power and influence the decision-making process. Especially in one-tier corporate board systems, members of a single board of directors are likely to identify as a social group in which effects of reciprocity and social influence should always be considered (O'Reilly III and Main 2007). In this regard, most research on social-psychological mechanisms and CEO compensation has investigated one-tier board systems (O'Reilly III and Main 2007). However, since CEO duality is declining and compensation committees are in place more often, it is important to illuminate social-psychological influences in this functionally separated decision-making process comparable to that in a two-tier board system (Gilson 2001).

Against this background, we investigate possible social-psychological mechanisms in the executive compensation setting process in Germany. The German setting enables us to assess these mechanisms in more detail for several reasons. First, we can examine how social-psychological mechanisms drive CEO compensation when the negotiating parties do not belong to a single board due to a two-tier board system. The statutory separation between management and control should enable the supervisory board to fulfill a control function effectively and determine appropriate compensation contracts. However, universal effects of reciprocity and social influence should also appear between members of different boards. Second, we can focus on the two main actors in the compensation setting process—namely the CEO and the chair of the supervisory board—and their characteristics and personal backgrounds. This focus on the two main actors makes findings on social-psychological mechanisms less ambiguous because we can attribute effects distinctively to the two actors. Finally, due to a change in German legislation in 2006, we can analyze social-psychological effects on specific salary components.

In the following, we derive hypotheses for the effects of social-psychological mechanisms in a German setting. Thereby, we focus on mechanisms that have been shown to affect CEO compensation in prior studies (e.g., Belliveau et al. 1996; Fiss 2006; Main et al. 1995). Specifically, we develop hypotheses for the effects of reciprocity and similarities between the CEO and the chair of the supervisory board on CEO compensation.

2.2.1 Reciprocity

Reciprocity is considered an important social norm. The norm requests that individuals repay what others have provided (Cialdini 2001). This rule does not only refer to actual payments but also favors, gifts, or invitations. Main et al. (1995) argue that if a CEO can select new directors, these directors may feel obligated to the CEO such that the norm of reciprocity is activated. This obligation would stem from the payments the directors receive for their appointment and the possible experience of a positive impact on the directors' social statuses. Directors could repay these benefits by granting CEOs generous compensation contracts. Hence, Main et al. (1995) predict and find that CEOs who have been appointed before directors serving on the compensation committee receive higher compensation levels.

Other studies focus on the benefits of being a member of the (supervisory) board themselves. For example, Fiss (2006) argues that the norm of reciprocity is likely to be activated if board members experience an increase in their compensation. Consequently, in his study of compensation in German TMT, he predicts and finds that increases in supervisory board compensation positively affect TMT compensation. Similarly, O'Reilly III and Main (2010) show that compensation committee chairs' fees strongly relate to CEO compensation.

Based on these findings, we expect that reciprocity is relevant for German CEOs and the chair of the supervisory board. Precisely, we predict that a longer tenure of the CEO than the chair and higher levels of chair compensation will be associated with a more favorable compensation package with higher levels of total and fixed compensation and a less performance-contingent compensation. Moreover, although

we assume that CEO compensation is less performance-driven, the short- and mid-term compensation component included in the compensation package is likely to be higher in a more favorable compensation package because reciprocity encourages less critical evaluations of CEO performance by the chair (Westphal and Zajac 1995).[2]

H1a: A longer tenure of the CEO compared to the chair of the supervisory board is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.

H1b: A higher level of compensation of the chair of the supervisory board is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.

2.2.2 Demographic similarities

The similarity-attraction effect describes the tendency to feel attracted to others similar to oneself (Byrne 1971; Montoya and Horton 2013). Thus, similarity may lead to a stronger identification and sympathy between individuals (Byrne et al. 1966). Concerning CEO compensation, similarity and liking between CEOs and chairs of the supervisory board may lead to chairs' less critical evaluations of CEOs' performance. For example, Westphal and Zajac (1995) argue that sharing similar beliefs about strategic decisions—as indicated by demographic similarity—may lead directors to attribute good performance to the CEOs' ability and decision-making but negative performance to environmental factors beyond the CEOs control. Moreover, when similarity and liking between CEOs and chairs are high, chairs may feel a lesser need to monitor and control CEO decisions. In line with this consideration, Goergen et al. (2015) show that dissimilarities in age between the CEO and the chair of the supervisory board indicate mistrust and impact monitoring effectiveness positively. Alternatively, Westphal and Zajac (1995) expect and find that increases in demographic similarity between the CEO and the board of directors are associated with favorable compensation contracts with increases in total compensation and less performance-contingent compensation. Further, Main et al. (1995) study the effects of age similarity between CEOs and board members. However, they find only weak support for predicting that a higher level of similarity leads to higher CEO compensation.

To sum up, these findings indicate that demographic similarity between the CEO and the chair of the supervisory board may affect the compensation setting process

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[2] Favorable evaluations may also affect the granting of long-term incentives. However, we refrain from explicitly including long-term incentives in our hypotheses for two reasons. First, the valuation of share-based payments is taken directly from the annual reports. Therefore, we cannot ensure that long-term incentives are comparable across observations. Second, 37.53% of firms in our sample do not grant long-term incentives at all. Thus, the lower number of observations for the analyses of long-term incentives could negatively affect the statistical power of our analyses.

such that the chair is willing to grant a favorable compensation package. Specifically, we expect that similarity increases the chair's willingness to grant high levels of total and fixed compensation and a less-performance driven compensation. Moreover, sympathetic chairs are likely to evaluate CEO performance with leniency such that short- and mid-term incentives should be higher. Concerning demographic similarity, we rely on a set of indicators that can be easily determined such that both the CEO and the chair on the one hand and interested third parties, on the other hand, are easily able to assess the level of similarity between the CEO and the chair. In detail, we consider basic demographics such as age and nationality as well as educational demographics such as educational degree and field of study.

> **H2a**: A higher level of demographic similarity in terms of age between the CEO and the chair of the supervisory board is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.
>
> **H2b**: A higher level of demographic similarity in terms of nationality between the CEO and the chair of the supervisory board is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.
>
> **H2c**: A higher level of demographic similarity in terms of the educational degree between the CEO and the chair of the supervisory board is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.
>
> **H2d**: A higher level of demographic similarity in terms of the field of study between the CEO and the chair of the supervisory board is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.

2.2.3 Similar experiences

Similarity may not only refer to demographic similarity but also similar experiences. These similar experiences may also influence the relationship between the CEO and the chair of the supervisory board. Specifically, a chair of the supervisory board who has served or is still serving as a CEO may develop an understanding of the CEO's role. Prior research has generally shown that perspective-taking increases empathy (e.g., Decety and Jackson 2004). Having made similar experiences within the focal or another company, chairs with CEO experiences can easily take the perspective of the current CEO. Hence, the chair may feel sympathetic with the CEO, and the empathy could lead to supportive behavior expressed by a compensation package the CEO considers favorable (Fiss 2006).

From a different perspective, the chairs may refer to their own CEO compensation contracts when determining the current CEO's compensation. As outlined

before, O'Reilly III et al. (1988) argue that CEOs prefer to appoint other CEOs as new board directors to evoke social comparison mechanisms. Social comparison theory postulates that individuals strive to compare with others with similar attitudes or abilities (Festinger 1954; Goodman 1974). Therefore, the appointment of CEOs as directors may affect the compensation setting process such that chairs that also have (outside) CEO experiences compare their own compensation as CEO with that of the current CEO and determine the current CEO's pay accordingly (O'Reilly III et al. 1988). Consequently, O'Reilly III et al. (1988) predict and find that outside directors' salary levels are positively associated with CEO compensation.

Moreover, Westphal and Zajac (1997) argue that having a chair with CEO experience may evoke a generalized norm of reciprocity. As outline above, reciprocity generally considers a direct exchange of benefits between two parties. However, reciprocity may also refer to situations in which individuals do not reciprocate by directly repaying their benefactor but rewarding another individual that is part of the same social exchange situation (Ekeh 1974). Hence, the chairs would not necessarily reciprocate the benefits they received as CEOs within the relationship with their chair. Instead, they may pay favors forward by benefitting other CEOs with whom they are working as chairs of their supervisory boards. Consequently, this generalized social exchange situation would encourage favorable compensation packages for the CEO.

Taken together, we expect that having a chair of the supervisory board that has CEO experiences positively affects CEO compensation.

> **H3**: A chair of the supervisory board who has worked as a CEO is associated with a higher total CEO compensation, a higher fixed CEO compensation, a higher short- and mid-term CEO compensation, and a lower share of performance-contingent CEO compensation.

3 Study design

3.1 Sample selection and description

To test our hypotheses, we collect data for a comprehensive sample of German listed firms. More precisely, we use all non-financial constituents[3] of the German HDAX Index with a dualistic corporate governance system[4] for fiscal years from 2006 to 2011. For that period, the HDAX Index comprises the 30 largest German blue-chip stocks in terms of market capitalization and trading volume (DAX), the 50 following

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[3] Banks, financial services, insurance and real-estate companies are considered financial companies. 108 observations belong to this group.

[4] For stock corporations (Aktiengesellschaft, AG) and partnerships limited by shares (Kommanditgesellschaft auf Aktien, KGaA) dualistic structures are default. However, both types of enterprises may also opt for another structure, thus emphasizing the need for individual investigation. Of the HDAX companies, 66 observations do not meet either the criterion regarding the legal form or the criterion of a dualistic governance structure.

Table 1 Sample selection procedure

Selection step	# of Obs
Firm-year observations for all firms listed at least once in HDAX between 2006 and 2011	876
Firm-year observations for firms which are not listed as stock corporations or partnerships limited by shares or do not have a dualistic board structure	66
Firm-year observations for financial firms (banks, financial services, insurance, real estate)	108
Firm-year observations for non-financial stock corporations or partnerships limited by shares with dualistic board structures listed in HDAX	**702**
Firm-years with unusual events (e.g., insolvency, disposition, rebranding)	65
Firm-years with no individual disclosure of executive compensation based on the opting-out clause (§ 286 Abs. 5 HGB)	122
Firm-years with intra-year appointment of CEO	66
Firm-years with negative compensation components or negative total compensation	4
Final sample	**445**

mid-cap stocks (MDAX) as well as the 30 largest and most liquid issues from various technology sectors (TecDAX).[5] A company is included if listed in the HDAX at least once in the sample period. This approach is superior to an end-fixation of the sample as no survivorship bias can occur. It is also superior to a front-fixation as changes in industry composition in the sample period are accounted for (Elton et al. 1996).

Our initial sample yields 702 firm-year observations from 117 non-financial stock corporations or partnerships limited by shares with dualistic governance structures; 65 firm-years with unusual events like insolvency, disposition, or rebranding are excluded. Further, German publicly listed companies may choose not to disclose the individual compensation data using an opting-out clause (according to the German commercial code, § 286 Abs. 5 HGB),[6] eliminating additional 122 firm-year observations. Finally, observations were eliminated in the case of intra-year CEO appointments (66 firm-year observations) and in the case of negative compensation components or negative total compensation (4 firm-year observations). Thus, the final sample consists of 445 firm-year observations from 98 companies. Table 1 summarizes the sample selection procedure. However, for individual analyses, sample sizes may be lower due to single missing data points for variables.[7]

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[5] Since its introduction in 1996, the size of the MDAX Index has varied over time. Starting with 70 stocks in 1996, the MDAX was reduced to 50 stocks in 2002. Lastly, in 2018, the MDAX was expanded again to 60 stocks to additionally include some companies previously listed exclusively in the TecDAX.

[6] The use of the opting-out clause varies between indices, with smaller companies opting out more frequently. For example, while only four firm-year observations are eliminated in the blue-chip segment DAX, 47 are eliminated in the mid-cap index MDAX.

[7] When all variables are included (models with suffix b), the baseline sample size for our main analyses in Table 3 is 303 observations stemming from the model explaining the total CEO compensation (model 1b). Some firms do not report granting short- and mid-term incentives, thus reducing the sample size to 298 in model 3b. We chose to treat these five observations as missing instead of manually inserting a value of zero at this point to analyze the determinants of short- and mid-term incentives if granted. For analyzing the share of short- and mid-term incentives (model 4b) or variable incentives (model 5b) in

3.2 Dependent variables

As outlined earlier, the opportunity to investigate German CEOs' incentives in such detail stems from a change in legislation regarding compensation disclosure taking effect in 2006, which allows more sophisticated analyses and conclusions. We collected the compensation data by scanning the compensation section of the companies' annual reports. Fixed CEO compensation (variable *CEO_FIX*), other CEO benefits (*CEO_OTHER*), short-term and mid-term incentives (*CEO_STIMTI*) as well as long-term incentives (*CEO_LTI*)[8] were collected separately. Total CEO compensation is calculated as the sum of these components (*CEO_TOTAL*). The share of each of the CEO's total compensation package components is computed as the respective component over *CEO_TOTAL*, thus resulting in *CEO_SHAREFIX*, *CEO_SHAREOTHER, CEO_SHARESTIMTI,* and *CEO_SHARELTI.* Additionally, the share of variable compensation in the CEO's total compensation package (*CEO_ SHAREVAR*) is calculated as the sum of short-term and mid-term (*CEO_STIMTI*) and long-term incentives (*CEO_LTI*) over total compensation (*CEO_TOTAL*).

The relevant variables to test our hypotheses are *CEO_TOTAL, CEO_FIX, CEO_ STIMTI, CEO_SHARESTIMTI,* and *CEO_SHAREVAR*. The absolute values for *CEO_TOTAL, CEO_FIX,* and *CEO_STIMTI* enter the regressions in their natural logarithm, indicated by adding "*_LOG*" to the variable code.

3.3 Independent variables and control variables

The independent variables and some of the control variables stem either from demographic characteristics or occupation-specific characteristics. For both types of data, there is no comprehensive data set available (e.g., Elston and Goldberg 2003). Hence, we hand-collected a unique dataset using the following sources sequentially: published annual reports, company websites, corporate press releases, the "Lexis-Nexis" and "Munzinger Personenarchiv" databases, a general web search (mostly leading to press articles such as portraits or interviews), and public personal registers. If none of these sources led to the required information, we contacted the companies' investor-relations departments.

Footnote 7 (continued)

the total compensation package, these observations naturally carry values of zero. Counterintuitively, the number of observations for the model explaining the fixed compensation (model 2b) is higher than in the model for the total compensation. The reason are missing values for the *TSR* and/or *ROE* variables that are not needed for model 2b. We follow the approach frequently favored in econometrics to not align the sample size to the "smallest common denominator" to avoid selection effects, although aligning the sample is rather common, e.g., in the accounting literature. The different sample sizes between models with suffix a and suffix b result from missing data points mainly for variables regarding the CEO and the chair of the supervisory board. We do not analyze these differences further due to their lack of relevance for testing the hypotheses.

[8] The valuation of share-based payments is taken directly from the annual reports. Missing or inconsistent data hinders us from pursuing our own valuation efforts. For a similar discussion, see Finkelstein and Hambrick (1989).

3.3.1 Reciprocity

To capture whether the CEO has a longer tenure than the chair (*LONGER_TEN-URE*) as a proxy for reciprocity (H1a), we first determine the CEO's tenure (*CEO_TENURE*) and the chair's tenure (*CSB_TENURE*). The CEO's (the chair's) tenure is measured as the number of years since a person was appointed CEO (chair) by the focal company in a given year. After that, we computed a dichotomous variable *LONGER_TENURE* that takes the value 1 when *CEO_TENURE* was higher than *CSB_TENURE* and 0 otherwise (Main et al. 1995). Concerning H1b, the chair's compensation level (*CSB_TOTAL*) is considered another trigger of reciprocity and is measured as the sum of fixed and variable payment components of the compensation the chair of the supervisory board receives for this function in the focal company. However, since both CEO compensation and the chair's compensation are likely to be driven by firm size to at least some extent, we include a size-adjusted excess pay in our regression models (*CSB_TOTAL_EXCESS*). We compute *CSB_TOTAL_EXCESS* by subtracting the median of the log-transformed chair's total compensation for the same firm-size decile from the logarithm of the chair's total compensation (Fahlenbrach 2009).

3.3.2 Demographic similarities

Regarding the second set of hypotheses (H2a-d), demographic similarities between the CEO and the chair are exemplarily represented by two variables that consider basic demographic similarities, namely similarity in age (*AGE_SIM)* and similarity in nationality (*NAT_SIM*), as well as two variables that describe educational similarity, namely similarity in educational degree (*DEGREE_SIM)* and similarity in the field of study (*STUDY_FIELD_SIM*).

For *AGE_SIM*, the difference between the CEO's age (*CEO_AGE)* and the chair's age (*CSB_AGE*) is computed as *AGE_DIF*. Then, the maximum value for *AGE_DIF* in the sample is identified, and each value for *AGE_DIF* is subtracted from this maximum. Subsequently, the resulting difference is scaled by the maximum for *AGE_DIF* to arrive at *AGE_SIM,* which is continuous between 0 (low similarity) and 1 (high similarity).

Regarding similarity in nationality, we use a dummy variable *NAT_SIM* that takes the value of 1 if the CEO and the chair's nationality is the same and the value of 0 otherwise.

To measure *DEGREE_SIM*, we first collect the highest level of education of the CEO (*CEO_DEGREE)* and the chair of the supervisory board (*CSB_DEGREE*), respectively, as ordinal variables with a value of 1 for high school graduation, apprenticeship, or comparable education, 2 for college or university degree, and 3 for Ph.D. or professor[9]). After that, *REL_DEGREE* is calculated as the difference

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[9] While in academia, a professor is considered a higher degree than a PhD, the majority of professors among CEOs and chairs of supervisory boards in Germany holds an honorary title which does not reflect their educational activities.

between the variables *CEO_DEGREE* and *CSB_DEGREE* (Fiss 2006). To finally compute *DEGREE_SIM,* each value of *REL_DEGREE* is subtracted from the maximum possible value of 2; after that, the difference is scaled by that maximum possible value, leading to continuous values between 0 (low similarity) and 1 (high similarity).

To capture similarity in the field of study (*STUDY_FIELD_SIM*), we create a dummy variable which takes the value 1 (and 0 otherwise) if the CEO's field of study equals the chair's field of study based on the following categorization: business and economics; law; natural sciences; engineering; others.

3.3.3 Similar experiences

For H3, we measure similar role experiences and construct a variable *CSB_CEO* that takes the value 1 if the chair has worked as CEO of the focal or another firm, and 0 otherwise.

3.3.4 Control variables

Concerning the control variables, we first consider the CEO's demographic and occupational characteristics that have been investigated from an economic or political research perspective. Referring to the economic perspective, the human capital theory (Becker 1964; Mincer 1970) indicates that older and better-educated CEOs and CEOs hired externally receive more favorable compensation packages (e.g., Hambrick and Finkelstein 1995; Brockman et al. 2016; Harris and Helfat 1997). Consequently, we consider the CEO's age (*CEO_AGE*), the CEO's educational level (*CEO_TITLE*), which is coded as a dummy variable with the value 1 if the CEO holds an academic title[10] (MBA, Ph.D., or professor) in the relevant year and 0 otherwise, and a potential internal recruitment (*CEO_INT*). Studies from a political perspective refer to the CEO's (relative) power over the board of directors or the supervisory board. Following prior literature, we assume that the number of external board memberships of the CEO and the chair affects the CEO's compensation package such that a higher number of external board memberships of the CEO (the chair) is positively (negatively) associated with a favorable compensation package (Belliveau et al. 1996; Core et al. 1999; Wade et al. 1990). Consequently, the number of external board memberships is considered *CEO_EXT* for the CEO and *CSB_EXT* for the chair of the supervisory board.

Besides the CEO's and chair's characteristics, we consider firm-specific characteristics as control variables. More specifically, we include total shareholder return (*TSR*) as a market-based performance measure (Fiss 2006), return on equity (*ROE*) as an accounting-based performance measure (Veliyath and Bishop 1995), company

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[10] In Germany, earning the Ph.D. does not necessarily imply pursuing an academic career. In fact, most of the Ph.D. candidates leave for the industry after graduation. In addition, the professor's degree can be granted on an honorary basis, which again does not imply that the person is (exclusively) working as a scholar.

size (*TA_LOG*) measured as the natural logarithm of total assets (Tosi et al. 2000), future investment opportunities measured as the market-to-book ratio (*MTB*) (Core et al. 1999), the Beta (*BETA*) according to Sharpe's (1963) market model using daily trading data over a time horizon of 52 weeks (Bidwell 2011; Bloom and Milkovich 1998; Hambrick and Finkelstein 1995), and the proportion of shares in free float (*FF*) as an indicator of diminishing direct shareholder influence (Kaserer and Wagner 2004). Furthermore, leverage might play a unique role in the German context as German companies largely depend on bank financing with potentially non-negligible bank influence on business conduct (Elston and Goldberg 2003). Consequently, we use the debt ratio as a proxy (*DEBT*), calculated as total debt over total assets. Firm-specific variables up to this point are collected from Thomson Reuters Datastream with values winsorized at the 1st and 99th percentile. Additionally, the number of members of the executive board (*MEMB_EB*) and supervisory board (*MEMB_SB*) is incorporated into our variables (Ferrero-Ferrero et al. 2012; Fiss 2006).

The "Appendix" provides descriptions of all variables included in the analyses.

3.4 Statistical analysis

To test the proposed hypotheses, we apply multivariate regression analysis. Separate models are established to investigate the determinants of the five different components of the compensation package, i.e., (1) the total CEO compensation, (2) the fixed CEO compensation, (3) the short- and mid-term compensation, and the share of performance-contingent CEO compensation based on (4) short- and mid-term incentives as well as (5) short-term, midterm and long-term incentives. In general, we propose the following equation:

$$
\begin{aligned}
Comp = {} & \beta_1 LONGER\_TENURE + \beta_2 CSB\_TOTAL\_EXCESS + \beta_3 AGE\_SIM + \beta_4 NAT\_SIM \\
& + \beta_5 DEGREE\_SIM + \beta_6 STUDY\_FIELD\_SIM + \beta_7 CSB\_CEO + \beta_8 CEO\_AGE \\
& + \beta_9 CEO\_TITLE + \beta_{10} CEO\_INT + \beta_{11} CEO\_EXT + \beta_{12} CSB\_EXT + \beta_{13} TSR \\
& + \beta_{14} ROE + \beta_{15} TA\_LOG + \beta_{16} MTB + \beta_{17} BETA + \beta_{18} FF + \beta_{19} DEBT + \beta_{20} MEMB\_EB \\
& + \beta_{21} MEMB\_SB + \sum_t \beta_t Year_t + \sum_k \beta_k Industry_k + \varepsilon.
\end{aligned}
$$

(1)

To determine the different models, we use five different compensation measures *Comp*: *CEO_TOTAL_LOG* (Model 1), *CEO_FIX_LOG* (Model 2), *CEO_STIMTI_LOG* (Model 3), *CEO_SHARESTIMTI* (Model 4), and *CEO_SHAREVAR* (Model 5). Moreover, the return measures *TSR* and *ROE* are not considered in Model 2 because fixed compensation should not depend on performance.

Similar to Fahlenbrach (2009) and Rapp and Wolff (2010), we deploy two-way fixed effects models with dummies for industry and year since the Hausman (1978) test indicates endogeneity for the majority of models. Thereby, we assume that firm-specific factors are sufficiently captured by the industry and refrain from including firm fixed effects.[11] Besides, we use cluster-robust standard errors (White 1980) to

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[11] A model with firm fixed effects analyzes effects that stem from changes within the firm over time. However, corporate governance variables which would also be included in our model are largely time-

encounter heteroscedasticity. Moreover, to test for multicollinearity, we compute variance inflation factors (VIF) for our independent variables in all our models. The highest VIF of 6.11 for the variable *TA_LOG* lies below the value of 10 but above the value of 5, which both are considered relevant threshold values (O'brien 2007). Similarly, we find that the largest correlations among independent variables are between *TA_LOG* and *MEMB_EB* ($\rho = 0.6613$, not tabulated) and *MEMB_SB* ($\rho = 0.7980$, not tabulated), respectively. However, since these variables are not our main variables of interest, we still include all of them in the regression models.

4 Results

4.1 Descriptives

Table 2, Panel A depicts the descriptive analysis of the CEO compensation in the sample. Mean CEO total compensation amounts to 2.444 million euros. The relatively high standard deviation of 2.118 million euros combined with the first quartile of 0.948 million, the median of 1.909 million euros, and the third quartile of 3.295 million euros suggests immense pay heterogeneity. On average, 38.43% of this total compensation is paid as fixed compensation, 44.45% as short-term or mid-term incentives, and 14.62% as long-term incentives. Thus, the variable part amounts to 59.07% of the CEO's total pay. The other components, which mainly comprise expense reimbursements, have a share of only 2.5%.

Table 2, Panel B presents the descriptive statistics for the independent variables. Concerning tenure, in about half of the observations (0.51), the CEO has a longer tenure than the chair of the supervisory board. Moreover, the chair's mean compensation amounts to 0.155 million euros per year, with a relatively high standard deviation of 0.136 million euros. Furthermore, CEOs and chairs are relatively similar in their basic demographics regarding age (0.65) and nationality (0.79). Regarding educational demographics, similarity in educational degree (0.71) is higher than similarity in the field of study (0.45). Finally, 73% of the chairs have gained CEO experience.

The descriptive analyses for the control variables are provided in Table 2, Panel C. Mean CEO age is 54.19 years (standard deviation 6.86 years). Slightly more than half of the CEOs hold an academic title such as an MBA, Ph.D., or professor. Moreover, 50% of the CEO observations stem from internally-hired CEOs, and CEOs hold, on average, 1.79 external board memberships. In contrast to this, chairs of supervisory boards hold, on average, 3.74 external board memberships.

Concerning the firm-specific characteristics, it is noteworthy that the sample consists of companies with an average free float of 74.80%, and less than one-third of

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Footnote 11 (continued)

invariant. Thus, a model with firm fixed effects would have to determine coefficients based on a small number of firms for which corporate governance variables change (Fahlenbrach 2009).

Table 2 Descriptive statistics

Variables	# Obs	Mean	Std. Dev	Min	Q1	Median	Q3	Max
Panel A: CEO's compensation (dependent variables)								
CEO_TOTAL	445	2,444.13	2,118.47	21.00	947.50	1,909.00	3,295.00	16,596.20
CEO_FIX	445	713.83	456.81	21.00	384.00	600.00	925.00	2,700.00
CEO_SHARE-FIX	445	38.43%	18.34%	5.34%	25.39%	34.93%	47.24%	100.00%
CEO_STIMTI	445	1,177.30	1,211.74	0.00	321.72	810.00	1,610.00	11,040.00
CEO_SHARES-TIMTI	445	44.45%	19.45%	0.00%	32.12%	45.36%	57.01%	92.95%
CEO_LTI	445	499.80	957.72	0.00	0.00	151.20	569.70	9,306.90
CEO_SHARELTI	445	14.62%	16.84%	0.00%	0.00%	9.63%	25.35%	92.41%
CEO_SHARE-VAR	445	59.07%	19.05%	0.00%	49.37%	62.86%	72.27%	94.48%
CEO_OTHER	445	53.20	106.57	0.00	0.00	22.50	46.60	1,300.80
CEO_SHARE-OTHER	445	2.50%	4.35%	0.00%	0.00%	1.17%	2.61%	46.44%
Panel B: Independent variables								
LONGER_TENURE	427	0.51	0.50	0.00	0.00	1.00	1.00	1.00
CSB_TOTAL	389	155.12	136.18	0.00	65.10	114.60	197.00	1,100.00
CSB_TOTAL_LOG	388	4.73	0.82	2.23	4.18	4.75	5.28	7.00
CSB_TOTAL_EXCESS	388	−0.04	0.62	−2.12	−0.30	0.02	0.31	1.68
AGE_SIM	403	0.65	0.23	0.00	0.52	0.68	0.81	1.00
NAT_SIM	411	0.79	0.41	0.00	1.00	1.00	1.00	1.00
DEGREE_SIM	445	0.71	0.33	0.00	0.50	1.00	1.00	1.00
STUDY_FIELD_SIM	377	0.45	0.50	0.00	0.00	0.00	1.00	1.00
CSB_CEO	445	0.73	0.44	0.00	0.00	1.00	1.00	1.00
Panel C: Control variables								
CEO_AGE	430	54.19	6.86	31.00	49.00	55.00	59.00	72.00
CEO_TITLE	436	0.51	0.50	0.00	0.00	1.00	1.00	1.00
CEO_INT	445	0.50	0.50	0.00	0.00	1.00	1.00	1.00
CEO_EXT	389	1.79	2.01	0.00	0.00	1.00	3.00	8.00
CSB_EXT	403	3.74	2.45	0.00	2.00	4.00	5.00	11.00
TSR	434	12.98%	50.87%	−80.66%	−23.32%	9.49%	40.73%	193.69%
ROE	440	10.62%	23.30%	−111.77%	6.03%	12.94%	19.86%	69.25%
TA (in bn. EUR)	445	17.47	37.10	0.06	0.78	2.29	12.74	187.41
TA_LOG	445	1.10	1.95	−2.84	−0.24	0.83	2.54	5.23
MTB	434	2.53	1.69	0.50	1.46	2.09	3.02	9.73
BETA	442	0.99	0.43	0.02	0.70	0.97	1.26	2.09
FF	439	74.80%	22.54%	13.00%	60.00%	78.00%	94.00%	100.00%

Table 2 (continued)

Variables	# Obs	Mean	Std. Dev	Min	Q1	Median	Q3	Max
DEBT	445	34.18%	21.58%	0.00%	18.87%	34.63%	49.17%	89.77%
MEMB_EB	445	4.40	1.65	2.00	3.00	4.00	5.00	10.00
MEMB_SB	445	12.19	5.63	3.00	6.00	12.00	16.00	21.00

This table depicts the descriptive statistics of CEOs' compensation components, the independent variables, and the control variables. It shows the number of observations (# Obs.), the arithmetic mean (Mean), standard deviation (Std. Dev.), minimum value (Min), first quartile (Q1), median (Median), third quartile (Q3), and the maximum value (Max). All compensation numbers are measured in thousands of euros. Detailed variable descriptions are provided in the Appendix

that is the standard deviation (22.54%). In combination with the first quartile of 60% and the third quartile of 94%, this hints at relatively low shareholder concentration levels, giving rise to potential agency conflicts and thus representing a fruitful setting for this study. Additionally, the average debt ratio is 34.18%. More than three fourth of the observations have a debt ratio of less than 50%. Thus, the monitoring impact of outside creditors—in Germany, often banks—might be limited. Finally, on average, the executive board consists of 4.4 people (with a minimum of 2 and a maximum of 10); the average number of members of the supervisory board is 12.19 (with a minimum of 3 and a maximum of 21).

4.2 Hypotheses tests

Table 3 presents the results of the multivariate regressions conducted to test the hypotheses. For all models, we conducted regressions in which (a) only firm-specific control variables and (b) all variables were included. All models show significant *F*-values. Hence, they have significant explanatory power. The adjusted R^2 for the models with total, fixed, or short- and mid-term compensation as dependent variables ranges between 51.46% and 77.43%; for the models with *CEO_SHARESTIMTI* and *CEO_SHAREVAR* as dependent variables, the adjusted R^2 value is considerably lower, ranging from 18.85% to 37.35%. In all cases, adjusted R^2 is higher for the fully specified models than for the models that only include firm-specific variables. In the following, we focus on the fully specified models because these contain the hypothesis-testing variables.

H1 deals with reciprocity between CEO and chair. In this context, H1a posits that a longer CEO tenure than the chair's tenure is associated with higher total, fixed, short- and mid-term pay and a lower variable share of the CEO's compensation. However, we find a significant association between *LONGER_TENURE* and components of the compensation package only for fixed compensation. More precisely, a longer tenure of the CEO is associated with an increase of 7.54% in fixed compensation.[12] Hence, we do not conclude that a longer tenure generally leads to a more favorable compensation package. In contrast, Fiss (2006) finds that a score that

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[12] The economic effect is calculated using $exp(\beta_1) - 1 = exp(0.0727) - 1 = 0.0754$.

Table 3 Multivariate regressions

Dependent variable	CEO_TOTAL_LOG		CEO_FIX_LOG		CEO_STIMTI_LOG		CEO_SHARESTIMTI		CEO_SHAREVAR	
Model	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
LONGER_TENURE		0.0439		0.0727*		0.0188		−0.0225		0.0031
CSB_TOTAL_EXCESS		0.1618***		−0.0164		0.2574***		0.0525**		0.0729***
AGE_SIM		−0.5345***		−0.6319***		−0.1522		0.1458**		0.0079
NAT_SIM		−0.0954		−0.0755*		0.1257		0.0771***		0.0127
DEGREE_SIM		−0.1493		0.0155		−0.0746		−0.0223		−0.0470*
STUDY_FIELD_SIM		0.0567		0.0441		0.0239		0.0051		0.0038
CSB_CEO		0.1541**		0.0126		0.1601		0.0254		0.0472*
CEO_AGE		0.0334***		0.0177***		0.0344***		−0.0006		0.0034*
CEO_TITLE		0.1968***		0.1275***		0.0997		−0.0218		0.0064
CEO_INT		−0.1149**		−0.1135***		−0.0793		0.0081		0.0110
CEO_EXT		0.0119		0.0229**		0.0048		−0.0025		−0.0064
CSB_EXT		−0.0118		−0.0017		−0.0139		−0.0014		−0.0037
TSR	0.0888	0.0405			0.2213*	0.1089	0.0161	0.0045	0.0311	0.0214
ROE	−0.2029	0.0887			0.4626*	0.8715***	0.2468***	0.2662***	0.1281**	0.0936
TA_LOG	0.3174***	0.2722***	0.2481***	0.2645***	0.3324***	0.2607***	−0.0048	−0.0151	0.0170**	0.0114
MTB	0.0661**	0.0940**	−0.0102	0.0146	0.0354	0.0489	0.0068	0.1824***	0.0229***	0.0233**
BETA	−0.0488	−0.0157	0.0663	0.1092**	−0.1879*	−0.1890*	−0.0429*	−0.0058	−0.0435*	−0.0624**
FF	0.4620***	0.6325***	0.3181***	0.5724***	0.3773**	0.5826**	0.1772***	−0.0689**	0.0639	−0.0117
DEBT	−0.2978	0.0956	−0.0050	0.0291	0.0581	0.4723*	0.0019	0.0024	−0.0135	0.0151
MEMB_EB	0.0120	0.0031	−0.0333**	−0.0345***	0.0077	−0.0013	0.0045	0.0024	0.0145**	0.0114**

Table 3 (continued)

Dependent variable	CEO_TOTAL_LOG		CEO_FIX_LOG		CEO_STIMTI_LOG		CEO_SHARESTIMTI		CEO_SHAREVAR	
MEMB_SB	0.0211**	− 0.0076	0.0094	− 0.0110**	0.0215*	0.0056	0.0049	0.0053*	0.0063**	0.0019
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Obs	425	303	431	306	409	298	425	303	425	303
R^2 (adj.)	0.5737	0.6929	0.6295	0.7743	0.5146	0.6010	0.1885	0.2462	0.2968	0.3735
F-value	48.96***	31.93***	64.07***	49.31***	29.75***	22.13***	5.82	4.61***	13.58	8.88***

The table presents the regression results for the hypotheses tests with different dependent variables: *CEO_TOTAL_LOG, CEO_FIX_LOG, CEO_STIMTI, CEO_SHARES-TIMTI*, and *CEO_SHAREVAR*. Below the regression coefficients, the number of observations (# Obs.), the adjusted coefficient of determination R^2 (adj.), and the *F*-value of specification tests are given

***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively

captures the relative difference between tenure (and not only whether the CEO has longer tenure than the chair) is positively associated with average TMT compensation. Thus, a relatively longer tenure of the CEO than the chair may influence CEO compensation. Nevertheless, this strong influence may not base on the norm of reciprocity and the chair's desire to repay the "favor of the appointment." Instead, a relatively longer tenure may reflect the power and influence the CEO has built up over the years (Fiss 2006).[13]

H1b utilizes the chair's excess total compensation as an indicator for reciprocity. Higher size-adjusted excess pay should, in turn, relate to a more favorable CEO compensation package. The significant coefficients on *CSB_TOTAL_EXCESS* in Model 1b and Model 3b support this prediction for total compensation and short- and mid-term incentives. Specifically, an increase of the chair's excess pay by 10% is associated with a 1.55% increase in total compensation and a 2.48% increase in short- and mid-term incentives.[14] However, we find no significant positive association of *CSB_TOTAL_EXCESS* to fixed pay. Moreover and contrary to our expectations, the coefficients for the share of both short- and long-term and overall variable payment are significantly positive, indicating that a higher chair pay relates to a higher share of performance-contingent pay for the CEO. This result suggests that the chair is per se willing to grant higher pay levels. However, higher-paid chairs incentivize higher performance more strongly. A possible explanation for this is the fact that higher-paid chairs take their office more seriously.

In sum, our results for the impact of reciprocity on CEO compensation suggest that reciprocity due to higher payments for the chair is likely to promote higher pay levels. Nevertheless, our results also strongly suggest that the incentive effect is likely not weakened as a means to act reciprocally. Instead, it might even be strengthened.

Our second set of hypotheses deals with demographic similarity between CEO and chair concerning age, nationality, educational degree, and field of study. In the hypothesis development, we suggest that similarity is associated with a more favorable compensation package if it creates sympathy between the two negotiating actors. Concerning similarity in age, we find significantly negative coefficients of *AGE_SIM* for total and fixed pay in Model 1b and Model 2b. Hence, a one-standard-deviation increase of *AGE_SIM* is associated with a decrease of total pay by 11.57% and a decrease of fixed pay by 13.53%.[15] Moreover, we find a significantly positive coefficient for the share of short- and mid-term incentives in Model 4b. These results indicate a less favorable compensation package if the degree of age similarity

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[13] Including a relative measure for tenure instead of a dummy variable in our analysis leads to significant associations.

[14] The economic effect is calculated using $1.1^{\beta_2} - 1$, i.e., $1.1^{0.1618} - 1 = 0.0155$ for total compensation and $1.1^{0.2574} - 1 = 0.0248$ for short- and midterm incentives.

[15] The economic effect is calculated using $exp(\beta_3 * SD) - 1$, i.e., $exp(-0.5345 * 0.23) - 1 = -0.1157$ for total compensation and $exp(-0.6319 * 0.23) - 1 = -0.1353$ for fixed compensation.

between CEOs and chairs of the supervisory board is high. Hence, we have to reject H2a. One explanation could be that fairly older chairs may be benevolent towards CEOs because they feel more experienced or of higher status. In fact, in 76.76% of the cases, the chair is older than the CEO. However, the closer the CEO's age is to the chair's age the more important social comparison might become (Festinger 1954). Hence, the chair might want to differentiate himself from the CEO and ensure a superior feeling, thus giving the CEO a less favorable compensation package. Consequently, age similarity affects CEO compensation negatively.

Regarding similarity in nationality, results show a significantly negative coefficient of *NAT_SIM* for fixed pay in Model 2b such that having the same nationality is associated with a decrease of 7.27% in fixed compensation.[16] Moreover, we find a significantly positive coefficient for the share of short- and mid-term incentives in Model 4b. Because the coefficients have the opposite signs to our expectations, we reject H2b. In our sample, with the exception of three cases, similarity in nationality means that both the CEO and the chair having a German background in all but three cases. Because similarity thus tends to be the normal case, nationality may not be a relevant dimension where similarity leads to feelings of liking of empathy. In contrast, when dissimilarity in nationality is considered, the majority of cases comprises of a German chair and a non-German CEO. In those settings, the chair may be more benevolent towards the foreign CEO such that dissimilarity is more likely to result in a favorable compensation package than similarity.

Concerning similarity in educational degree (H2c), we find that *DEGREE_SIM* is negatively and significantly associated with the overall share of performance-contingent pay in Model 5b. This result suggests that degree similarity affects performance-contingency in a way that is likely more preferable for the CEO, although the effect is not strong enough to increase the overall compensation.

Finally, regarding H2d, we find no significant association between similarity in the field of study (*STUDY_FIELD_SIM*) and the compensation package components. Thus, we have to reject H2d. However, overly broad categories concerning the field of study may drive this result. Specifically, most CEOs and chairs have a background in business and economics or natural sciences in our sample. Both fields of study are characterized by many different specializations and different forms of studying. Thus, our measure might not capture high levels of similarity. However, a more precise measure might lead to only very few cases in which similarity is high. Consequently, the study field may generally not be a good proxy for similarity between the CEO and the chair of the supervisory board.

In sum, the results for demographic similarities highlight that different facets of similarity operate very differently regarding the compensation components affected. More precisely, similarity in educational degree possibly triggers feelings of sympathy and increased trust to some extent. In contrast, age similarity is more likely linked to social comparisons. Finally, in the German setting, similarity in nationality

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[16] The economic effect is calculated using $exp(\beta_1) - 1 = exp(-0.0755) - 1 = 0.0727$.

may not be a relevant dimension due to the common German background of most CEOs and chairs.

In H3, we discussed the effect of the chair's prior CEO experience on CEO compensation. We argued that such a chair might be more empathic and willing to reciprocate favors received from others, thus supporting the CEO with a more favorable compensation package. In line with this expectation, we find that *CSB_CEO* is significantly and positively associated with CEO total compensation in Model 1b. Specifically, having a chair with CEO experience is associated with a 16.66% increase in total compensation.[17] Concerning performance-contingency, however, results show a significantly positive association between *CSB_CEO* and *CEO_SHAREVAR* in Model 5b. Thus, we find partial support for our expectation such that the chair's similar experience positively affects total compensation. Nevertheless, the chair's experience is also associated with an overall stronger performance contingency. Thus, a chair of the supervisory board who has previously worked as a CEO does not unconditionally grant a more favorable compensation package but may focus on the CEO's actual performance and the related incentives more strongly.

Taken together, we can build up a relatively nuanced picture of the social-psychological perspective on executive compensation: while potential reciprocity, demographic similarities, and similar experiences might suggest more favorable compensation packages from the CEO's perspective, the empirical results do not support this assumption per se. Specifically, for some of the dimensions investigated, namely chair's size-adjusted excess pay, similarity in age and nationality, and the chair's experience as CEO, we find indications that the variable proportion of the CEO compensation package either remains unaffected or even increases and, hence, should not be a source of significant concerns to shareholders.

Regarding the control variables, our results show a significantly positive influence of the CEO's age (*CEO_AGE*) and the CEO's academic title (*CEO_TITLE*) on total compensation and fixed compensation. Additionally, *CEO_AGE* positively relates to short- and mid-term compensation and the overall share of performance-contingent compensation. Moreover, internal CEO recruitment (*CEO_INT*) is negatively associated with total and fixed compensation. These results indicate support for the explanatory power of human capital theory. Further, we find that the CEO's external board memberships (*CEO_EXT*) are positively associated with fixed pay, which is in line with managerial power theory.

Regarding the firm-specific control variables, we find a positive association between our performance measure *ROE* and *CEO_STIMTI_LOG* as well as the share of short- and mid-term incentives*,* which provides partial support for the pay-for-performance hypothesis.[18] Furthermore, company size (*TA_LOG*) relates to higher values of the total, the fixed, and the short- and mid-term compensation. Additionally, higher investment opportunities (*MTB*) are associated with higher

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[17] The economic effect is calculated using $exp(\beta_7) - 1 = exp(0.1541) - 1 = 0.1666.$

[18] *TSR* and *ROE* are not considered in Models 2a and 2b because fixed compensation (Models 2a and 2b) should not depend on performance.

CEO total pay and a higher proportion of variable pay. Moreover, *BETA* shows a significantly positive association with fixed pay and a significantly negative association with short- and mid-term incentives and the overall share of performance-contingent compensation. Finally, higher free float (*FF*) relates to increased total, fixed, and short- and mid-term compensation and a lower share of short- and midterm incentives. This relation suggests that less shareholder concentration impacts the compensation package positively for the CEO, presumably because monitoring is less intense.

4.3 Additional analyses

4.3.1 Ownership concentration

Our previous analyses indicate that social-psychological mechanisms might affect the determination of CEO pay such that the CEO uses their influence to negotiate a favorable compensation package. However, the described effects may also depend on the shareholders' ability to monitor and control the firm's decision-making processes effectively. Hence, we conduct additional tests to determine whether our findings are moderated by ownership concentration as an indicator for ownership control (Fiss 2006; O'Reilly III et al. 1988; Wade et al. 1990). Specifically, we rerun our regressions and include interaction terms with interactions between ownership concentration (*OC*, computed as (1–*FF*)) and those independent variables that have shown significant associations with components of CEO pay.[19]

Results in Table 4 indicate that, after including the interaction terms, the main effects of our independent variables remain principally the same. Moreover, in most cases, the interaction terms are not significantly associated with CEO compensation components. Hence, in our setting, ownership concentration moderates the effect of social-psychological mechanisms only to a very limited extent without revealing a relevant pattern.

Prior studies also provide mixed results concerning ownership control. For example, O'Reilly III et al. (1988) find that ownership control has no significant influence on compensation. In contrast, Fiss (2006) finds a significant interaction effect between having a former CEO as chair and ownership control such that TMT compensation is significantly lower when a company is owner-controlled. However, in our analysis, we find no effect for the interaction between *CSB_CEO* and *OC* on fixed compensation.

4.3.2 Similar experiences

In our main analysis, we investigate the effect of the chair's experience as CEO in general. However, prior research explicitly examines either chairs who are former CEOs of the *focal* company (Fiss 2006) or directors who serve or have served as

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[19] We exclude the control variable *FF* from the regressions due to multicollinearity issues.

Table 4 Analysis of ownership concentration

Dependent variable	CEO_TOTAL_LOG	CEO_FIX_LOG	CEO_STIMTI_LOG	CEO_SHARESTIMTI	CEO_SHAREVAR
Model	(1)	(2)	(3)	(4)	(5)
LONGER_TENURE	0.0370	0.0568	0.0291	−0.0183	0.0076
CSB_TOTAL_EXCESS	0.1754***	−0.0055	0.2735***	0.0530**	0.0730***
AGE_SIM	−0.5196***	−0.6054***	−0.1813	0.1309**	−0.0106
NAT_SIM	−0.1388	−0.1412***	0.1099	0.0875***	0.0277
DEGREE_SIM	−0.1257	0.0307	−0.0374	−0.0175	−0.0450
STUDY_FIELD_SIM	0.0574	0.0431	0.0095	0.0017	0.0016
CSB_CEO	0.1719**	0.0181	0.2017*	0.0299	0.0500*
LONGER_TENURE×OC	0.1490	−0.0050	0.2007	0.0274	−0.0096
CSB_TOTAL_EXCESS×OC	0.1480	0.1034	−0.2116	−0.0658	−0.0587
AGE_SIM×OC	0.9061	0.8969*	0.6291	−0.0891	−0.1541
NAT_SIM×OC	−0.4755*	−0.6342***	−0.3640	0.0550	0.1116
DEGREE_SIM×OC	−0.1346	0.0940	0.5413	0.1200	0.0938
CSB_CEO×OC	−0.2782	0.0192	−0.4716	−0.0999	−0.1216
CEO_AGE	0.0312***	0.0165***	0.0343***	−0.0001	0.0041**
CEO_TITLE	0.1973***	0.1254***	0.0775	−0.0266	0.0017
CEO_INT	−0.0951	−0.1035**	−0.0747	0.0056	0.0077
CEO_EXT	0.0143	0.0260**	0.0031	−0.0036	−0.0076*
CSB_EXT	−0.0137	0.0000	−0.0148	−0.0016	−0.0039
TSR	0.0470		0.1049	0.0022	0.0178
ROE	0.0825		0.8940***	0.2693***	0.0977
TA_LOG	0.2692***	0.2579***	0.2607***	−0.0139	0.0135
MTB	0.0975***	0.0180	0.0469	0.1751***	0.0214*
BETA	−0.0190	0.0957**	−0.2266**	−0.0070	−0.0642**
DEBT	0.1310	0.0692	0.4879*	−0.0729**	0.0026
MEMB_EB	0.0032	−0.0347***	0.0009	0.0029	0.0120**

Table 4 (continued)

Dependent variable	CEO_TOTAL_LOG	CEO_FIX_LOG	CEO_STIMTI_LOG	CEO_SHARESTIMTI	CEO_SHAREVAR
MEMB_SB	−0.0058	−0.0078	0.0019	0.0039	0.0002
Year fixed effects	yes	yes	yes	yes	yes
Industry fixed effects	yes	yes	yes	yes	yes
# Obs	303	306	298	303	303
R^2 (adj.)	0.6859	0.7753	0.5947	0.2388	0.3750
F-value	29.38***	47.92***	20.29***	4.08***	8.22***

The table presents the regression results for the additional analyses of ownership concentration with different dependent variables: *CEO_TOTAL_LOG, CEO_FIX_LOG, CEO_STIMTI, CEO_SHARESTIMTI,* and *CEO_SHAREVAR.* Below the regression coefficients, the number of observations (# Obs.), the adjusted coefficient of determination R^2 (adj.), and the *F*-value of specification tests are given

***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively

CEO at *another* company (O'Reilly III et al. 1988; Westphal and Zajac 1997). While the mechanisms of perspective-taking, social comparison, and the generalized norm of reciprocity are likely to unfold for chairs who have been CEO at another company, different effects may occur if the chair has been a former CEO of the focal firm.

In Germany, it is quite common for former CEOs to become chairs of the supervisory board upon retirement (Andres et al. 2014). Against this background, Fiss (2006) hypothesizes based on the empathy perspective that having a former CEO of the focal company as a board chair is positively related to managerial compensation. However, in his analysis, the hypothesis is not supported. This finding may be driven by the fact that Fiss (2006) could not investigate CEO compensation directly but needed to rely on TMT compensation. Thus, the effect of similar experiences might only be relevant for the CEO and might not spill over to the board's remaining members.

Alternatively, the chair's desire to protect the firm could dominate the effects of empathy. Consequently, the former CEO position provides the chair with the power to influence the compensation setting process such that a more controlling compensation package is determined. A chair of the supervisory board who has been a CEO of the focal firm may be especially controlling if the CEO is a firm outsider. In contrast, a former CEO and an internally recruited CEO may feel belonging to the same social group (O'Reilly III and Main 2007) such that effects of liking and sympathy may prevail.

Against this background, we rerun our regression analysis and exchange *CSB_CEO* with two dichotomous variables that take the value 1 if the chair has worked as CEO of another firm (*CSB_CEO_OTHER*) or as CEO of the focal firm (*CSB_CEO_FOCAL*), and 0 otherwise. Additionally, we consider an internal recruitment of the CEO (*CEO_INT*) by using a dummy variable that takes the value 1 in case of an internal appointment and investigate the interaction between an internal recruitment and a chair who has worked as CEO of the focal firm.

Our findings in Table 5 show similar effects of *CSB_CEO_OTHER* as of *CSB_CEO*. Specifically, *CSB_CEO_OTHER* is significantly and positively associated with total compensation in Model 1, fixed compensation in Model 2, and the overall share of performance-contingent compensation in Model 5.

Concerning chairs who are former CEOs of the focal company, we find a significantly negative association between *CSB_CEO_FOCAL* and *CEO_FIX_LOG* in Model 2. Moreover, we find a significantly positive association between *CSB_CEO_FOCAL* and both *CEO_SHARESTIMTI* and *CEO_SHAREVAR* in Model 4 and Model 5, reflecting a less favorable compensation package. The results indicate that the former CEO-chair may be interested in protecting their legacy by composing a compensation package that focuses on performance-contingent compensation and is less favorable for the focal CEO. However, we find opposing effects when the CEO has also been recruited from the focal firm. Specifically, the interaction between *CSB_CEO_FOCAL* and *CEO_INT* is significantly positively associated with fixed pay in Model 2. Further, the interaction term is significantly and negatively associated with the share of performance-contingent pay in Model 5. Thus, empathy and

Table 5 Analysis of similar experiences

Dependent variable	CEO_TOTAL_LOG	CEO_FIX_LOG	CEO_STIMTL_LOG	CEO_SHARESTIMTI	CEO_SHAREVAR
Model	(1)	(2)	(3)	(4)	(5)
LONGER_TENURE	−0.0182	−0.0130	0.0052	−0.0027	0.0033
CSB_TOTAL_EXCESS	0.1713***	0.0032	0.2554**	0.0475**	0.0693***
AGE_SIM	−0.4986***	−0.5851***	−0.1412	0.1366**	0.0120
NAT_SIM	−0.0916	−0.0709*	0.1245	0.0749**	0.0110
DEGREE_SIM	−0.1215	0.0654	−0.0810	−0.0373	−0.0583**
STUDY_FIELD_SIM	0.0548	0.0423	0.0206	0.0042	0.0010
CSB_CEO_OTHER	0.2222***	0.1087**	0.1728	0.0028	0.0455*
CSB_CEO_FOCAL	0.0223	−0.2662***	0.2058	0.1044**	0.1153***
CSB_CEO_FOCAL×CSB_CEO_OTHER	0.0165	0.1356*	−0.0856	−0.0493	−0.0809**
CEO_AGE	0.0339***	0.0178***	0.0348***	−0.0006	0.0037**
CEO_TITLE	0.2078***	0.1289***	0.1122	−0.0201	0.0159
CEO_INT	−0.0934	−0.1115**	−0.0524	0.0123	0.0311
CEO_EXT	0.0124	0.0230**	0.0058	−0.0021	−0.0055
CSB_EXT	−0.0166	−0.0115	−0.0124	0.0013	−0.0014
TSR	0.0474		0.1100	0.0019	0.0206
ROE	0.0866		0.8690***	0.2663***	0.0927
TA_LOG	0.2714***	0.2674***	0.2565***	−0.0169	0.0077
MTB	0.0942**	0.0095	0.0521	0.1912***	0.0260**
BETA	−0.0386	0.0768*	−0.1876*	−0.0044	−0.0570**
FF	0.6360***	0.5642***	0.5876**	−0.0587**	−0.0082
DEBT	0.0939	0.0018	0.4883*	0.0027	0.0304
MEMB_EB	0.0023	−0.0358***	−0.0008	0.0030	0.0120**
MEMB_SB	−0.0046	−0.0070	0.0065	0.0045	0.0021
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes

Table 5 (continued)

Dependent variable	CEO_TOTAL_LOG	CEO_FIX_LOG	CEO_STIMTI_LOG	CEO_SHARESTIMTI	CEO_SHAREVAR
# Obs	303	306	298	303	303
R^2 (adj.)	0.6990	0.8070	0.5984	0.2603	0.3789
F-value	33.28***	56.79***	20.89	4.92***	8.75***

The table presents the regression results for the additional analyses of similar experiences of the chair of the supervisory board with different dependent variables: *CEO_TOTAL_LOG*, *CEO_FIX_LOG*, *CEO_STIMTI*, *CEO_SHARESTIMTI*, and *CEO_SHAREVAR*. Below the regression coefficients, the number of observations (# Obs.), the adjusted coefficient of determination R^2 (adj.), and the *F*-value of specification tests are given

***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively

liking may only be prevalent when both the chair and the CEO have a background in the focal firm, and the CEO has been recruited internally.

5 Conclusions

This paper investigates social-psychological mechanisms that may unfold in the negotiation process between the CEO and the chair of the supervisory board regarding the determinants of total executive compensation, fixed compensation, short- and mid-term compensation, and the variable proportion of total compensation. We exploited the legislative change in Germany that individual executive compensation data must be disclosed in detail and hand-collected a unique dataset of constituents of the German HDAX that allowed us to shed light on possible social-psychological mechanisms in the pay determination process within a two-tier board system. This investigation is particularly relevant because it enables us to open the "black box" of CEO pay determination by analyzing two important actors in the process—the CEO and the chair of the supervisory board. Former studies, primarily from Anglo-American companies, could not analyze the negotiation process in such detail due to the lack of formal separation between the key actors in management and control. However, our investigation is also relevant for the Anglo-American corporate governance system since both systems have started to converge (Gilson 2001). The functional separation of the remuneration committee and the declining CEO duality leads to comparability, and it is thus possible to use the insights we have gained to better understand the determination process (Bruce et al. 2005; Conyon and He 2004; Fiss 2006).

We provide evidence for the social-psychological perspective's explanatory power, which is of particular importance since the economic and the political perspective have not delivered sufficient empirical evidence to fully explain the determination of CEO compensation. Reciprocity between the CEO and the chair, in particular, plays a crucial role in shaping CEO compensation packages that are more favorable for the CEO. More precisely, in line with findings by O'Reilly III and Main (2010), we show that a higher chair's excess compensation is associated with higher total and higher performance-contingent pay. Moreover, we find that a CEO's longer tenure than the chair's tenure increases fixed CEO compensation.

Concerning similarity, results are ambivalent. First, we find that age similarity is associated with a less favorable compensation package, especially regarding fixed compensation, which contradicts the results by Main et al. (1995). We argued that increasing similarity in age might evoke a social comparison perspective. The negotiation and determination of the CEO compensation could be a means for the chair of the supervisory board to set himself apart from the CEO. Second, our findings regarding similarity in educational degree are partially in line with our expectation such that higher similarity is associated with a decrease in performance-sensitive pay and hence more preferable from the CEO's perspective. Third, similarity in nationality leads to a less favorable compensation package. This result might be explained by the fact the majority of chairs is German and that dissimilarity—instead of similarity—leads to sympathy towards the foreign CEO and a more favorable compensation

package. In sum, these results reveal that similarity cannot be considered a universal construct, but its effects may depend on the extent to which a given dimension triggers social comparison concerns or feelings of sympathy and liking. In this regard, we illuminate the social-psychological effects of similarity in more depth than Westphal and Zajac (1995). The authors created a single measure for similarity out of different dimensions and generally found that an increase in similarity is associated with more generous compensation contracts. Finally, concerning similar experiences, we extend the investigation conducted by Fiss (2006) and examine in our main analysis chairs who have been CEO in either the focal firm or another firm. While Fiss (2006) finds no association between chairs with CEO experience in the focal firm and TMT compensation, we find a positive effect of CEO experience on both fixed compensation and the overall share of performance-contingent compensation. Moreover, an additional analysis that differentiates between the chair's CEO experiences in another company and the chair's CEO experiences in the focal company reveals that having made CEO experiences in another company leads to more total and fixed compensation but also to a higher share of performance-contingent compensation. Hence, outside CEO experiences may lead to a more empathic chair due to the increased total and fixed compensation. In contrast, for chairs who have been CEO at the focal company, we find a negative association with a favorable compensation package except when the CEO has been recruited internally. Overall, this study offers insights on social-psychological effects that play a role during the negotiation process between the CEO and the chair of the supervisory board which go beyond previous research and illuminates explicit mechanisms in more depth, as suggested by O'Reilly III and Main (2010).

Besides, it is worth noting that higher compensation does not seem to be granted unconditionally, which is different from theory and prior literature, especially for one-tier board systems. The chair's excess compensation, similarity in age and nationality, and prior CEO experiences are even associated with higher shares of variable pay. Consequently, CEO compensation's incentive function does not necessarily have to be compromised, even when pay is relatively high. Finally, another additional analysis shows that higher ownership concentration does not moderate the effects of reciprocity and similarity.

In conclusion, our findings provide guidance in which situations other members of the supervisory board and shareholders should monitor the relationship between the CEO and chairs more closely and challenge the negotiation process. Precisely, when the chair's payment triggers reciprocity concerns or when the CEO and the chair have a similar educational or experiential background, the negotiation process could be compromised. Close monitoring is especially necessary because, in our sample, a higher ownership control, which is typically associated with increased monitoring, does not moderate the effects of social-psychological mechanisms.

Naturally, our investigation exhibits some limitations that offer opportunities for future research. Since the concepts of reciprocity and similarity are only examined exemplarily based on selected indicators, future research should expand this approach and use other indicators to substantiate our findings further. Moreover, besides reciprocity and similarity, other social-psychological factors such as cultural influences, social norms, or self-concepts might influence behavior and

compensation. Hence, various concepts from the behavioral-accounting literature could be applied to establish a better understanding of the process of how executive compensation is determined. An interesting approach could be to explicitly combine the managerial-power hypothesis with the social-psychological perspective (e.g., in the light of Göx and Hemmer 2020). Concerning our data, the investigation is based on firms from the HDAX and focuses on the relationship between the CEO and the chair of the supervisory board. This database could be enlarged if other firms and all board members are included in the examination. However, data availability might be limited.

To sum up, future research should confirm these initial findings and provide further evidence regarding social-psychological constructs, as this perspective seems promising with this study being a first approach.

Appendix: Variables definitions

Variable	Description
CEO_TOTAL	Total compensation of the CEO; computed as the sum of fixed compensation (CEO_FIX), short- and mid-term incentives (CEO_STIMTI), long-term incentives (CEO_LTI), and other benefits (CEO_OTHER)
CEO_TOTAL_LOG	Log-transformed total compensation (CEO_TOTAL) of the CEO
CEO_FIX	Fixed compensation (in thousands of euros) of the CEO
CEO_FIX_LOG	Log-transformedfixed compensation (CEO_FIX) of the CEO
CEO_SHAREFIX	Share of fixed compensation (CEO_FIX) in the CEO's total compensation (CEO_TOTAL)
CEO_STIMTI	Short- and mid-term incentives (in thousands of euros) of the CEO
CEO_SHARESTIMTI	Share of short- and mid-term incentives (CEO_STIMTI) in the CEO's total compensation (CEO_TOTAL)
CEO_LTI	Long-term incentives (in thousands of euros) of the CEO; the valuation of share-based payments is taken directly from the annual reports
CEO_SHARELTI	Share of long-term incentives (CEO_LTI) in the CEO's total compensation (CEO_TOTAL)
CEO_SHAREVAR	Share of all variable compensation (CEO_STIMTI and CEO_LTI) in the CEO's total compensation (CEO_TOTAL)
CEO_OTHER	Other benefits of the CEO
CEO_SHAREOTHER	Share of other benefits (CEO_OTHER) in the CEO's total compensation (CEO_TOTAL)
CEO_TENURE	Number of years since the appointment as CEO
CSB_TENURE	Number of years since the appointment as chair of the supervisory board
LONGER_TENURE	Dichotomous variable (1/0) with value of 1 if CEO_TENURE is higher than CSB_TENURE
CSB_TOTAL	Total compensation of the chair of the supervisory board computed as the sum of fixed and variable compensation for the occupation as chair of the supervisory board
CSB_TOTAL_LOG	Log-transformedtotal compensation (CSB_TOTAL) of the chair of the supervisory board

Variable	Description
CSB_TOTAL_EXCESS	Size-adjusted excess log-transformed total compensation (CSB_TOTAL_LOG) of the chair of the supervisory board; to compute indicator, the median of CSB_TOTAL_LOG for the same firm-size decile is subtracted from CSB_TOTAL_LOG
CEO_AGE	Age of the CEO
CSB_AGE	Age of the chair of the supervisory board
AGE_DIF	Age difference of CEO and chair of the supervisory board; computed as the absolute value of the difference between CEO_AGE and CSB_AGE
AGE_SIM	Indicator for age similarity between the CEO and the chair of the supervisory board with values between 0 for low similarity and 1 for high similarity; to compute the indicator, AGE_DIF is subtracted from the highest value in the sample for AGE_DIF, and the highest value scales the difference for AGE_DIF
NAT_SIM_DUM	Dichotomous variable (1/0) with value of 1 if the CEO's nationality equals the chair's nationality and 0 otherwise
CEO_DEGREE	Highest level of education of the CEO; ordinal variable with value of 1 for high school graduation, apprenticeship, or comparable education, 2 for college or university degree, and 3 for Ph.D. or professor
CSB_DEGREE	Highest level of education of the chair of the supervisory board; ordinal variable with value of 1 for high school graduation, apprenticeship, or comparable training, 2 for college or university degree, and 3 for PhD or professor
REL_DEGREE	Relative level of education of CEO and chair of the supervisory board; computed as the difference between the ordinal variables CEO_DEGREE and CSB_DEGREE
DEGREE_SIM	Indicator for educational similarity between the CEO and the chair of the supervisory board with values between 0 for low similarity and 1 for high similarity; to compute the indicator, the absolute value of REL_DEGREE is subtracted from the maximum possible value for REL_DEGREE of 3, and the difference is by this maximum possible value of 3
STUDY_FIELD_SIM	Dichotomous variable (1/0) with value of 1 if the CEO's field of study equals the chair's field of study and 0 otherwise; fields of studies are categorized as business and economics, law, natural sciences, engineering, and others
CSB_CEO	Dichotomous variable (1/0) with value of 1 if the chair of the supervisory board has worked as CEO in another or the focal company and 0 otherwise
CEO_INT	Dichotomous variable (1/0) with value of 1 for an internal appointment of the CEO and 0 otherwise
CEO_TITLE	Dichotomous variable (1/0) with value of 1 if the CEO holds an academic title (Ph.D., professor, or MBA) and 0 otherwise
CEO_EXT	Number of external board memberships of the CEO
CSB_EXT	Number of external board memberships of the chair of the supervisory board
TSR	Total shareholder return
ROE	Return on equity
TA	Total assets
TA_LOG	Log-transformed total assets
MTB	Market-to-book ratio as an indicator for complexity
BETA	Systematic risk; measured by beta with benchmark index HDAX
FF	Indicator for the influence of shareholders; measured by the proportion of shares in free float

Variable	Description
DEBT	Indicator for influence of banks; measured by the debt ratio (total debt over total capital)
MEMB_SB	Number of supervisory board members
MEMB_EB	Number of executive board members
OC	Indicator for ownership concentration; computed as (1–FF)
CSB_CEO_OTHER	Dichotomous variable (1/0) with value of 1 if the chair of the supervisory board has worked as CEO in another company and 0 otherwise
CSB_CEO_FOCAL	Dichotomous variable (1/0) with value of 1 if the chair of the supervisory board has worked as CEO in focal company and 0 otherwise

Sources: Annual reports, company websites, LexisNexis, Munzinger Personenarchiv, web search, investor relations departments, Datastream

Declarations

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