Corporate Boards, Firm Sustainability and Executive Compensation: Evidence from European Firms

Dissertation

zur Erlangung des Doktorgrades

der Wirtschafts- und Sozialwissenschaftlichen Fakultät

der Eberhard Karls Universität Tübingen

vorgelegt von

M.Sc. M.A. Sarah Diederich

Tübingen

2025

1. Betreuer:	Prof. Dr. Kerstin Pull
2. Betreuer:	Prof. Dr. Patrick Kampkötter

Tag der mündlichen Prüfung:	23.04.2025
Dekan:	Prof. Dr. Taiga Brahm
1. Gutachter:	Prof. Dr. Kerstin Pull
2. Gutachter:	Prof. Dr. Patrick Kampkötter

Overview

Table of contents

List of figures

List of tables

List of abbreviations

CSR: Corporate Social Responsibility

DiD: Difference-in-Differences

ESG: Environmental, Social and Governance

FE: Fixed Effects

fWHR: facial Width-to-Height-Ratio

OLS: Ordinary Least Squares

1. Introduction

In an era defined by climate change and social inequities, it is no surprise that events such as BP's Deepwater Horizon oil spill in 2010, the 2015 Volkswagen emission scandal or the ongoing controversies around Nike sweatshops in East Asia make headlines and cause indignation around the globe. As societal expectations around the environmental and social matters grow (AGUILERA et al. 2021), the corporate world is marked by a continuing paradigm shift – moving beyond the sole pursuit of shareholder value and toward a commitment to a broader interest groups and also tackling the grander topics of sustainability and equity (ADNAN/TANDIGALLA 2017; WALLS/PHAN/BERRONE 2011). At the center of this shift lie corporate boards, the corporate organs in charge of firm leadership and reorientation in times of changing public foci and demands. One of the key players at the head of a firm which has received substantial attention from sustainability researchers in the past decades is the board of (non-executive) directors[1] (e.g. BEAR/RAHMAN/POST 2010; BEJI et al. 2021; POST/RAHMAN/MCQUILLEN 2015; POST/RAHMAN/RUBOW 2011).

In light of the public's increasing interest in non-financial aspects of firm performance, the first part of this doctoral thesis, consisting of chapters 2 and 3, will therefore revolve around the role of the board of directors in a firm's environmental and social performance. Entrusted with the protection of shareholder interests, the firm's strategic direction to ensure long-term profitability and the supervision and control of the executive directors (MERINO/MANZANEQUE 2016; ALUCHNA 2023; PAOLONE et al. 2024), the board of directors is in a powerful position to shape a firm's environmental and social outcomes by incorporating suitable objectives in corporate strategy (PAOLONE et al. 2024; HARJOTO/JO 2011; AGUILERA et al. 2006; PEARCE/ZAHRA 1991). Board composition has become a frequently analyzed structure to understand firm outcomes (MERINO/MANZANEQUE 2016), as it is a contingency determining the quality of a board's decisions, its faculty to give strategic direction and its ability to exercise the necessary control over executives (MERINO/MANZANEQUE 2016; PEARCE/ZAHRA

[1] In what follows, the terms "board of directors" or "board" refer to the group non-executive directors only, including the cases of a one-tier system. Executive directors will either be named as such or grouped as "executive board".

1992). In particular, board diversity has received substantial attention from researchers, albeit only rarely regarding their role in shaping environmental and social outcomes (e.g. BEAR/RAHMAN/POST 2010; BEJI et al. 2021; DARMADI 2011; HAFSI/TURGUT 2013). Chapters 2 and 3 address this gap by looking at different dimensions of board diversity and how they relate to firms' environmental and social performance.

Chapter 2 starts with an investigation of the effect of gender balancing laws in European countries on firms' environmental and social performance, and the role of firm size in that relation. While gender balancing laws do not per se contribute to better outcomes regarding either of the dimensions, we find that smaller firms which initially perform worse, however, substantially benefit from the regulations. Chapter 3 takes a broader look at board diversity in terms of a composition of board age, gender and nationality diversity, and its relation to more nuanced aspects of firms' environmental and social outcomes. Board size is introduced as a moderating factor in this relationship, and the results suggest that board diversity improves various dimensions of firms' environmental and social outcomes, but even more so in when boards are large.

The second part of this doctoral thesis, encompassing chapters 4 and 5, is dedicated to another seemingly never-ending source of repeated public outrage toward corporate boards and their part in social inequity: the matter of executive compensation. Unsurprisingly, the public discourse is heated when an institution such as the European Trade Union Confederation reports an average yearly CEO pay of 4.1€ million in Europe's top 100 firms, which is 110 times as much as the average full-time employee's income of 37,863€ (EUROPEAN TRADE UNION CONFEDERATION 2025). Apart from these large vertical compensation differences between executive directors and employees, there are also noticeable horizontal inequalities at the executive level. For instance, female executives in the UK's top 100 firms earned £1.5 million in 2020, while their male colleagues surpassed them by 40% with an average pay of £2.5 million (MOONEY 2021).

These highly salient differences in pay are not only part of public discourse but have also been a subject of debate amongst researchers for decades. Executives, who are in charge of managing the firm's daily operating business by order of the shareholders, are – in theory – compensated for their work based on their output (ALUCHNA 2023). Agency theorists argue that executive compensation structures are the result of optimal contracting, such that executive pay is a reflection of the executives' effort,

i.e. contingent on firm performance (DECKOP/MERRIMAN/GUPTA 2006; BERRONE/GOMEZ-MEJIA 2009; JENSEN/MECKLING 1976), and human capital (MURPHY/ZÁBOJNÍK 2004). Advocates of the managerial power hypothesis, on the other hand, reason that executive pay structures result from executives exploiting their power to maximize their own utility (BEBCHUK/FRIED/WALKER 2002; BEBCHUK/FRIED 2004; BEBCHUK/FRIED 2006). Apart from the power-based approach, the discrimination-based approach also makes the case that executive pay is inefficient in the sense that horizontal inequalities are not rationalizable based on performance factors. Instead, pay differences would stem from either preferences for or beliefs held against certain executives based on visible cues (ALBANESI/OLIVETTI/PRADOS 2015; SCHNEIDER/ISEKE/PULL 2021; EAGLY/KARAU 2002).

Building on these theories, chapters 4 and 5 speak to the literature aiming to uncover factors contributing to so far unexplained horizontal differences in executive pay structures. Precisely, chapter 4 sheds light on the (un)fairness of the gender pay gap at executive level based on the social perception of different executive functions as "feminine" or "masculine". We find that, while executive functions that are typically perceived as "feminine" are generally paid less, female executives suffer twice: they are either paid badly when they hold a "feminine" function, or they are paid less than their male colleagues when they hold "masculine" functions due to a perceived mismatch between their gender and the role they ought to perform. Chapter 5 examines the pay-performance-sensitivity in executive compensation arrangements and the moderating role of executives' perceived dominance based on a visible physical cue, the facial Width-to-Height-Ratio (fWHR). In line with the literature, we find that executive pay is sensible to changes in firm performance but also reveal that perceived dominance diminishes the pay penalty in case of bad performance, i.e. perceived dominance reduces the pay-performance-sensitivity in case of negative changes in firm value.

Although this thesis encompasses two major blocks, the first dedicated to the board of directors and their influence on environmental and social performance and the second devoted to executive compensation, the chapters are all connected in three main ways. First, they all cover (individuals on) corporate boards – both the board of directors and the executive board. Therefore, they are subject to the strand of research on corporate governance (e.g. BEAR/RAHMAN/POST 2010; BEJI et al. 2021; POST/RAHMAN/MCQUILLEN 2015; POST/RAHMAN/RUBOW 2011), which clarifies and analyzes

the allocation of responsibilities, duties and rights in a firm (AGUILERA et al. 2021; MERINO/MANZANEQUE 2016). Following that train of thought, the second block is also to some degree about the board of directors, given that the non-executive directors are confided with the task of designing and negotiating executive pay packages in the interest of the shareholders (MERINO/MANZANEQUE 2016; ALUCHNA 2023; PAOLONE et al. 2024). That is, inequitable executive pay structures can be ascribed to the board of directors.

Second, the chapters can be brought together under the umbrella term of ESG – standing for Environmental, Social and Governance. The term was first put into the spotlight of the corporate world by the United Nations' 2004 report titled "Who cares wins" (UNITED NATIONS 2004). The 'E' encompasses the ways in which firms engage to reduce their negative impact on the environment (AGUILERA et al. 2021; WALLS/BERRONE/PHAN 2012; WALLS/PHAN/BERRONE 2011); the 'S' reflects their relations with the social community and the promotion of social welfare (MCWILLIAMS/SIEGEL 2001; UNITED NATIONS DEVELOPMENT PROGRAMME 2023); the 'G' refers to good governance, i.e. practices ensuring a law-compliant, ethical leadership of the firm in the interest of its long-term well-being (HARJOTO/JO 2011; JAIN/JAMALI 2016; UNITED NATIONS DEVELOPMENT PROGRAMME 2023). ESG has since proceeded from being a mere buzzword to an imperative for sustainable business and corporate governance structures that foster sustainable practices (JAIN/JAMALI 2016).

For one, corporate boards are themselves shaped by ESG-guidelines, for instance by governance arrangements such as board diversity regulations or internal structures like committees (AGUILERA et al. 2006; JO/HARJOTO 2011). Chapter 2 looks at the implications such a regulation, namely gender-balancing reforms. For another, corporate boards themselves are a pivotal factor in reaching ESG goals. Chapters 2 and 3 analyze the contribution of the board of directors to *environmental* and *social* firm performance. Precisely, the board of directors can foster *environmental* and *social* performance by following good *governance* practices and setting appropriate incentives to executives with adequate pay arrangements. Chapters 4 and 5, however, shed light on the degree to which *governance* practices can be flawed. Under good *governance*, executive pay should be efficient and fair, hence neither excessive, nor be rooted in unequal or preferential treatment. While the board of directors is not directly scrutinized in these chapters, it designs and negotiates executive pay packages, such that

unexplained disparities in the latter can be ascribed to the board. (ECCLES/IOANNOU/SERAFEIM 2014; UNITED NATIONS DEVELOPMENT PROGRAMME 2023)

Third, chapters 2 to 5 all cover the implications of surface-level, i.e. from the outside immediately apparent, differences between non-executive and executive directors. Chapters 2 and 3 analyze firms' environmental and social performance as a result of (visible) aspects of board diversity. Particularly the diversity dimensions of gender (chapters 2, 3 and 4) and age (chapter 3) are salient attributes, while one could argue that nationality (chapter 3) might to some degree also be a visible attribute, if it is linked to ethnicity. While chapters 2 and 3 look at positive firm performance outcomes resulting from these observable differences, chapter 4 demonstrates a downside entailed by being categorized as a woman. Chapter 5 uses an observable facial measure to assess perceived executive dominance, the results giving another example of how visibly perceivable differences can yield unequal treatment.

After having briefly introduced the topics of the four studies composing this doctoral thesis, and after having presented their connections, the following paragraphs provide further details on the next chapters.

The implementation of legislative reforms can be considered as natural experiments to estimate the effect of the respective policy changes on various outcomes. With the introduction of gender balancing laws, policy makers artificially intervene in firms' corporate governance to promote gender equality on the highest corporate levels. Chapter 2, which is joint work with PHILIP YANG and JAN RIEPE, analyses an unintended, yet beneficial side-effect of those reforms. The study exploits the introduction of gender balancing laws in seven European countries to examine the impact of board gender diversity on firms' environmental and social performance. It builds on a body of literature on the role of corporate governance for firms' ESG outcomes (e.g. POST/RAHMAN/RUBOW 2011; POST/RAHMAN/MCQUILLEN 2015; BEAR/RAHMAN/POST 2010). We draw from agency theory, resource dependence theory and upper echelons theory to propose a direct positive effect of board gender diversity on environmental and social performance (AGUILERA ET AL. 2021; BEAR/RAHMAN/POST 2010; BEJI et al. 2021; BEN-AMAR/CHANG/MCILKENNY 2017; LI et al. 2017; MANNER 2010; POST/RAHMAN/MCQUILLEN 2015; SHAUKAT/QIU/TROJANOWSKI 2016). Moreover, we argue and hypothesize that smaller firms start off with lower environmental and social

performance. We further hypothesize that firm size moderates the effect of board gender diversity on environmental and social performance, with smaller firms benefiting more from gender-diverse boards. We confront our hypotheses with a staggered difference-in-differences approach, utilizing 7,253 firm-year observations from 990 European firms. While we find no evidence supporting the direct effect of board gender diversity on environmental and social performance, we find that smaller firms initially indeed perform worse but benefit extensively from the reforms regarding their sustainable performance. In additional analyses, we offer more nuanced insights into potential mechanisms behind the moderation effect by analyzing different dimensions of firm size based on earlier theoretical argumentation. Our results contribute to the literature by pointing out positive effects of gender-diverse boards for sustainability outcomes and by shedding light on the contingencies under which they are performant.

Chapter 3 follows the previous one by also looking at potential positive implications of board diversity for firms' environmental and social performance. The single-author study acknowledges that various dimensions of surface-level diversity might be at play simultaneously and measures board diversity as average across age, gender and nationality diversity. I look at the resource-based view through the lens of stakeholder theory to reason how highly diverse boards can improve firms' environmental and social performance and hypothesize a positive link (BARNEY 2018; BARNEY/KETCHEN/WRIGHT 2021; BEAMISH/CHAKRAVARTY 2021; FREEMAN/DMYTRIYEV/PHILLIPS 2021). I further argue from a resource-based view that large boards are better equipped in terms of better organizational and more human resources, such that board size takes on the role as a contextual variable enhancing the previously postulated positive relation. Different from previous literature, I predict a positive moderating effect of board size. Based on a firm and time fixed effects regression of 2,415 firm-year observations from listed European firms, I find empirical support for both hypotheses. A post-hoc analysis zooms into the sub-categories of environmental and social performance and finds differences in terms of effect sizes between the outcomes for the environmental sub-categories 'emissions', 'resource use', 'innovation' and the social sub-categories 'community', 'human rights', 'workforce' and 'product use'. This connects to previous literature by refining the general observation of positive implications of board diversity for sustainable performance and begs the theoretical question why particular outcomes are more strongly affected. Though, the most striking

observation emerges when board diversity is considered in its three individual components, hinting at detrimental implications of board age diversity for sustainable performance, which is even aggravated in large boards. This paper contributes to extant literature by ascribing a contextual, moderating role to board size in the relation between board diversity and environmental and social performance, rather than a direct one.

The joint work with ANJA ISEKE, KERSTIN PULL and MARTIN SCHNEIDER in chapter 4 explores how executives experience different pay outcomes based on their gender and the stereotypes and roles that are associated with it. Specifically, the study looks at how the gender pay gap at executive level is linked to gender stereotypes, defined as socially held beliefs about the personal attributes and social roles appropriate for women and men. By means of an online survey, we show that executive functions are subject to gender stereotyping, with certain functions, like IT, viewed as inherently "masculine" and others, like human resources, as "feminine" and hypothesize that the former are better paid. Based on role congruity theory we argue that, first, women are considered unfit leaders and, second, that they are considered unfit to hold "masculine" functions (EAGLY/KARAU 2002; PARKER/MUI/TITUS 2020). Based on this, we hypothesize an interaction between gender and executive function, such that female executives are penalized for occupying role-incongruent, i.e. "masculine" functions. The findings of a pooled OLS regression analysis based on 999 executive-year observations from European firms listed in the EURO STOXX 50 and STOXX Europe 50 support our hypotheses. Our findings are, amongst others, robust to changes in the measurement of our explanatory variable reflecting the masculinity of the executive's function(s). The results reveal that female executives face a Catch 22 situation: either they earn less because they occupy lower paid "feminine" functions, or they are paid less for holding role-incongruous "masculine" functions. Hence, contrary to male executives, they do not experience a pay increase by transitioning to better paid "masculine" functions. These findings contribute to the ongoing puzzle on the reasons for the gender pay gap by revealing stereotyping as one more contributing factor. Our findings highlight the need to establish stricter and better governance practices to challenge the unequal treatment of men and women in the corporate world.

The last study, presented in chapter 5, analyses the role of visible cues for apparent dominance in executives' pay-performance-sensitivities. The joint work with

STEFANIE EHMANN and JULIAN NÜßLE picks up on the puzzling findings of prior empirical research that reveals a positive, yet surprisingly weak link between executive pay and performance (EDMANS/GABAIX/JENTER 2017). We use executives' facial Width-to-Height-Ratio (fWHR), calculated with AI-supported image analysis from hand-collected photos, as a validated measure to approximate their perceived dominance (KAKKAR/SIVANATHAN/GOBEL 2020). Under good governance, agency theory predicts that changes in executive pay should ideally align with changes in firm value, i.e. an increase in firm value should lead to a positive change and a decrease in firm value should lead to a negative change in executive pay (JENSEN/MURPHY 1990). The connection between pay and performance should ensure that executives act in the best interest of the shareholders (HOLMSTROM 1979). In line with this, we hypothesize a positive link between changes in firm value and executive. Next, we argue with managerial power hypothesis that executive compensation does not always follow an optimal contracting approach, but rather that executives can influence their compensation packages in their favor through power (BEBCHUK/FRIED 2004; BEBCHUK/FRIED/WALKER 2002). We then introduce arguments from implicit leadership and socialization theories to reason that higher fWHR is associated with higher perceived dominance and introduce those arguments to the managerial power hypothesis to argue that executives with a higher perceived dominance can exert greater influence over the board to decouple their pay from performance. We followingly hypothesize a weaker pay-performance-sensitivity for executives with high fWHR, and more so in case of bad performance, when decoupling pay and performance is more beneficial to executives. We run a pooled OLS regression with firm- and year fixed effects based on a sample of 3,797 executive-year observations of executives from German DAX and MDAX companies. In line with the literature, we find a positive pay-performance-sensitivity (e.g. JENSEN/MURPHY 1990), and weak, yet robust supporting evidence that executives with higher levels of perceived dominance can decrease that sensitivity when firm value decreases. Our results extend the current outlook on executive power by proposing that, apart from 'hard' factors such as experience, also 'soft' factors such as physical appearance and presumptions associated with those can undermine efficient executive pay policies as a fundamental element of good governance practices.

Chapter 6 closes the doctoral thesis with a conclusion, including a summary of the four papers presented. This is followed by some general implications for the relation

between corporate governance, corporate boards and ESG. Finally, some limitations which are – amongst others – rooted in the data and applied methods, are pointed out and offer some directions for future research.

2. Board gender diversity and sustainable performance: A matter of firm size?[2]

2.1 Introduction

Businesses and society increasingly emphasize environmental and social sustainability (AGUILERA et al. 2021). Accordingly, firms face growing pressure to think beyond the financial implications of their actions pushing towards strategies that increase their environmental and social performance (WALLS/BERRONE/PHAN 2012). Because the implementation of such strategies as well as their outcomes are long-term oriented, governance structures are considered particularly well suited to embark on the necessary adjustments to improve firms' environmental and social performance (AGUILERA et al. 2021; EAGLY 2016; WALLS/BERRONE 2017).

The board of directors is one of the most frequently analyzed governance structures in terms of firms' long-term financial outcomes. Particularly, board gender diversity has attracted much attention from corporate governance scholars (e.g. BEJI et al. 2021; HE/JIANG 2019; LI et al. 2017; POST/RAHMAN/MCQUILLEN 2015; POST/BYRON 2015). Advocates of board gender balancing reforms pushing towards more board gender diversity typically argue about the business case that an increased share of women in corporate boards enhances firms' financial performance (EAGLY 2016). Despite a substantial amount of literature on the performance implications of board gender diversity, the theoretical understanding and empirical findings on this relationship are inconclusive (ADAMS 2016; KIRSCH 2018; YANG et al. 2019; ZHANG 2020). In contrast, the literature that ties board gender diversity to environmental and social performance is scarce, even though this relationship is more easily attributable to the differences of preferences and traits between women and men (AGUILERA et al. 2021).

Our paper focuses on the theoretical and empirical understanding of environmental and social performance implications of board gender diversity. Based on agency theory, resource dependence theory, and upper echelons theory, we argue and hypothesize that board gender diversity relates positively to firms' environmental and social

[2] This chapter is based on joint work with PHILIP YANG (University of Paderborn) and JAN RIEPE (University of Paderborn): "A sizable advantage: Environmental and social performance implications of board gender diversity".

performance. Further, we analyze the context dependency of this effect. We argue and hypothesize that, while larger firms have a higher environmental and social performance, the positive effect of board gender diversity on environmental and social performance is larger for smaller firms. We resort to differences between larger and smaller firms in terms of capabilities, reporting, visibility, complexity and resources to make our case.

We test these hypotheses with firm level data from Thomson/Refinitiv that we match to data on corporate boards from BoardEx. The endogeneity between firm performance and corporate boards is a key factor in most board gender diversity studies, which affects the empirical inferences. To limit the various sources of endogeneity and to account for the fact that the environmental and social performance shows a strong and positive time trend, we exploit the introduction of mandatory board gender balancing reforms in seven European countries for our identification strategy. Specifically, we use a staggered difference-in-differences approach to identify the effects of increased board gender diversity on the environmental and social performance with a unit fixed effect on the individual and time fixed effect on the year level.

Using a sample of 990 firms covering 7,253 firm-year observations between 2003 and 2019, we find no evidence of a positive direct effect of board gender diversity on environmental and social performance. However, our results imply that these direct effects are strongly moderated by firm size in a way that board gender diversity heavily improves the environmental and the social performance when firms are smaller. This finding is particularly interesting given that we find larger firms generally to have higher environmental and social performance. We validate the robustness of our results by using alternative measures for board gender diversity as well as environmental and social performance and by showing that the moderating effects are not pure reporting effects. In additional analyses, we further show distinct mechanisms behind the firm size moderating effects using a set of rationales and variables.

We contribute to the literature in three main ways. First, our study sheds light on the direct effects of board gender diversity on the environmental and social performance as well as the moderating role of firm size. This speaks to the scarce but fast-growing literature that until now has only considered the direct effects of either board gender diversity or firm size on the environmental and social performance but did not account for their interdependencies. In fact, our theoretical arguments and empirical

results highlight the importance of board gender diversity to improve the environmental and social performance particularly for smaller firms. This is especially relevant because, for one, smaller firms generally tend to have lower environmental and social performance compared to larger firms. Moreover, our arguments and findings delimit board gender diversity from the share of women directors, i.e. gender homogeneity, and show that the former is indeed more beneficial to firms.

Second, our identification strategy addresses several endogeneity concerns that empirical studies on environmental and social performance implications of board gender diversity typically face. By using board gender balancing reforms as an empirical setting to employ a staggered difference-in-differences approach with firm and year level fixed effects, our empirical results are not biased by systematic differences with respect to the selection of women into corporate boards or improved environmental and social performance over time.

Third, our additional analyses provide a more nuanced perspective on firm size and its implications for the effect of board gender diversity on environmental and social performance. Our empirical results indicate that several aspects that change between firms of different sizes, i.e. their capabilities, reporting practices, visibility, complexity and resources, have quite diverging inferences on sustainable performance. These results emphasize the need for future research to dig deeper into the underlying mechanisms to differentiate best practices for a variety of contexts.

2.2 Theoretical framework

We analyze the implications of board gender diversity for corporate environmental and social performance, and define environmental performance as a firm's capacity to alleviate its negative externalities on the natural environment (AGUILERA et al. 2021; WALLS/PHAN/BERRONE 2011; WALL/BERRONE/PHAN 2012). Amongst others, environmental performance includes pollution control and prevention, e.g. through waste reduction; the implementation of environment friendly product life-cycles, e.g. by using renewable energies in the production process; and sustainable resource use, that is, not overstraining and exploiting the planets' natural resources (HART 1995; WALLS/PHAN/BERRONE 2011).

We define social performance as a firm's ability to promote social welfare that exceeds the minimum legal requirements and its own (shareholders') interests

(MCWILLIAMS/SIEGEL 2000). Socially performative firms enhance the prosperity of external stakeholders, e.g. the broader community, as well as internal stakeholders, e.g. employees, and evade social failures that harm any social stakeholders (HUQ/CHOWDHURY/KLASSEN 2016; KELLING et al. 2021). External social performance, for instance, includes the support of local businesses, granting the suppliers fair payment, thereby improving employment in the community, and increasing the inclusion of minority groups. Internal social performance, for example, consists in improving employees' working conditions, including their workplace safety and work-life-balance, and in providing better healthcare (HUQ/CHOWDHURY/KLASSEN 2016; MCWILLIAMS/SIEGEL 2000).

We examine firms' environmental and social performance in the context of corporate governance structures. Corporate governance defines how rights and responsibilities, including power and resources, are structured and allocated between actors in a firm (AGUILERA et al. 2021; AGUILERA/JACKSON 2003). Specifically, we analyze the implication of gender diversity in corporate boards as a governance structure with relevance for environmental and social performance. Research has operationalized board gender diversity in terms of the composition of men and women on a board (BEAR/RAHMAN/POST 2010; BEJI et al. 2021), such that a board with a perfectly balanced gender share would mark the highest possible gender diversity (LI et al. 2017).

2.1.1 Board gender diversity and firms' environmental and social performance

Research on the implications of board gender diversity for environmental and social performance argues in favor of positive direct effects based on agency theory (AGUILERA et al. 2021; BEAR/RAHMAN/POST 2010), resource dependence theory (AGUILERA et al. 2021; BEAR/RAHMAN/POST 2010; BEJI et al. 2021; BEN-AMAR/CHANG/MCILKENNY 2017; POST/RAHMAN/MCQUILLEN 2015; SHAUKAT/QIU/TROJANOWSKI 2016), and upper echelons theory (AGUILERA et al. 2021; BEJI et al. 2021; LI et al. 2017; MANNER 2010; POST/RAHMAN/MCQUILLEN 2015).

According to agency theory, managers will not necessarily emphasize environmental and social performance, because these are marked by high investments and uncertainty in the short run (BERRONE/GOMEZ-MEJIA 2009; DE VILLIERS/NAIKER/VAN STADEN 2011), likely only becoming strategically and financially profitable in the long-run (ARAGÓN-CORREA/SHARMA 2003). For short-term profit maximization,

managers might thus neglect environmental and social commitments, even if these would benefit the firm's and shareholders' long-term profits (ARAYAKARNKUL/CHATJUTHAMARD/TREEPONGKARUNA 2022).

Through effective monitoring and interest alignment, gender-diverse boards might mitigate this problem. The presence of women directors associates with more comprehensive (ADAMS/FERREIRA 2009; BRAMMER/MILLINGTON/PAVELIN 2007; CARTER/SIMKINS/SIMPSON 2003; DE MASI/SŁOMKA-GOŁĘBIOWSKA/PACI 2021; NGUYEN/LOCKE/REDDY 2015) and long-term oriented monitoring (GROENING 2019; MATSA/MILLER 2013). Concerning interest alignment, women's inclination towards long-term, environmental, and social subjects leads to better coupling of stakeholder and manager interests in the pay designs (ADAMS/FERREIRA 2009). The presence of male directors, though, might help prevent over-monitoring and the associated frictions between directors and managers (ADAMS/FERREIRA 2009). Furthermore, investments in environmental and social practices are marked by short-term risk and higher uncertainty of returns (BERRONE/GOMEZ-MEJIA 2009; DE VILLIERS/NAIKER/VAN STADEN 2011) making less risk-averse male directors (POST/RAHMAN/MCQUILLEN 2015) useful for designing and implementing the corresponding incentive schemes.

Research on upper echelons theory focuses on the relevance of directors' cognitive frames, resulting from personal experiences and characteristics, for strategic decision-making (HAMBRICK 2007). These theoretical predictions have been backed by studies on the individual level, observing spillovers of personal attributes to the upper scales of organizations, where leaders do not only take on the role of leaders, but also remain in their social gender roles (EAGLY/JOHANNESEN-SCHMIDT/VAN ENGEN 2003; EAGLY/WOOD 1991; EAGLY/KARAU 1991). Women and men differ in terms of their cognitions and behaviors due to traditional gender socialization (ASHFORTH/MAEL 1989; BEJI et al. 2021; BROUGH et al. 2016) e.g., in terms of caregiving, compassion and other-orientation (EAGLY et al., 2003; HUNTER et al., 2004; ZELEZNY et al., 2000). As a result, gender-diverse boards are better equipped to cover various interests and avoid negligence of single stakeholder groups (HE/JIANG 2019; NADEEM et al. 2020; POST/RAHMAN/MCQUILLEN 2015).

Similarly, resource dependence theory focuses on the differences between male and women directors in terms of resources they can provide to a firm (LÜCKERATH-ROVERS 2013; PFEFFER/SALANCIK 1978). Resource dependence theory inquires that

the composite experiences, knowledge and networks of directors represent resources which have an effect on strategic decisions regarding environmental and social performance (AGUILERA et al. 2021; PFEFFER/SALANCIK 1978). A board's endowments help to form a link between the firm and its corporate milieu, meaning the external entities and stakeholders with whom it interacts to conduct business. These links provide communication possibilities with stakeholders and improve information flow between the firm and the stakeholders and thereby yield in the latter's support and commitment and enhance the firm's legitimacy (HILLMAN/DALZIEL 2003; LÜCKERATH-ROVERS 2013; PFEFFER/SALANCIK 1978).

Based on agency theory, upper echelons theory and resource dependence theory, we argue that gender-diverse boards are more performant regarding sustainable firm outcomes than gender-homogenous boards and thus hypothesize:
H1a: Board gender diversity relates positively to a firm's environmental performance.
H1b: Board gender diversity relates positively to a firm's social performance.

2.1.2 Firm size and firms' environmental and social performance

Prior research has identified firm size as an important antecedent of environmental and social performance for various reasons. First, larger firms are more complex in the sense that they operate in more diversified areas, leading to numerous ties with society and diverse stakeholders. They are therefore of higher interest to the public and more frequently subject to media reporting (REVERTE 2009), public scrutiny and higher visibility (BALDINI et al. 2018; BANSAL/CLELLAND 2004; BRAMMER/PAVELIN 2008; MEZNAR/NIGH 1995; PFEFFER/SALANCIK 1978; POWELL 1991). Consequently, highly complex and visible firms have more external stakeholders to consider and are, on the one hand, pressured to make environmental and social investments to satisfy them (DUQUE-GRISALES/AGUILERA-CARACUEL 2021). If they do not, they risk stakeholder and investor hostility as well regulatory consequences (BALDINI et al. 2018; REVERTE 2009). That is, they are under pressure to maintain legitimacy with their stakeholders (ZHANG/WANG/ZHOU 2020) and to avoid penalties for low environmental and social performance (ACABADO et al. 2020; BRAMMER/PAVELIN 2008; ORLITZKY 2001). On the other hand, larger firms can also expect more advantages from engagement in environmental or social activities than smaller, less visible, and complex firms (JOSEFY

et al. 2015; ZHANG/WANG/ZHOU 2020). For instance, this could be due to stronger ties to external stakeholders and better access to resources (WU/LIANG/ZHANG 2020).

Second, larger firms have more human resources, which helps in pursuing environmental and social targets (DAMANPOUR 2010) and exploiting economies of scale (JOSEFY et al. 2015), as they result in diverse cognitive frames and more knowledge. Additionally, slack human resources do not only advance environmental and social innovations due to accumulation of the necessary economic and technical information and the promotion of an innovation culture, but also provide the necessary resources to tackle the various tasks (ADOMAKO/NGUYEN 2020).

Third, larger firms have distinct potential to exert higher environmental and social investments (MCWILLIAMS/SIEGEL 2000) and innovation (DAMANPOUR 2010). These investments and innovations are more easily realized in larger firms due to the financial slack and technological resources they can dedicate to this specific purpose (DAMANPOUR 2010). Thus, financial slack might play a role in the pursuit and achievement of environmental and social performance (LEYVA-DE LA HIZ/FERRON-VILCHEZ/ARAGON-CORREA 2019; MELLAHI/WILKINSON 2010). Furthermore, larger firms can more easily diversify their capital investments as they dispose of higher financial means, and are hence better prepared to take financial risks and setbacks (DAMANPOUR 2010; ZONA/ZATTONI/MINICHILLI 2013).

Fourth, larger firms disclose their environmental and social activities more extensively (BALDINI et al. 2018; BRAMMER/PAVELIN 2008; REVERTE 2009), because they are under more political and regulatory pressure for conformity (BRAMMER/PAVELIN 2008) and to maintain their legitimacy with the broader public (REVERTE 2009). Their thorough reporting additionally enhances data availability for outsider assessment on environmental and social performance, thus improving the scores upon which environmentally and socially responsible investors put their money into a firm (DREMPETIC/KLEIN/ZWERGEL 2020).

H2a: Firm size relates positively to a firm's environmental performance.

H2b: Firm size relates positively to a firm's social performance.

2.2.3 The moderating role of firm size

We have established that literature suggests a positive association between firm size and the environmental and social performance (ACABADO et al. 2020;

DREMPETIC/KLEIN/ZWERGEL 2020). Compared to their smaller counterparts, larger firms start from a higher level of environmental and social performance, independently of their board gender diversity. Vice versa, smaller firms have lower levels of environmental and social performance with more leeway for improvement. To exploit this leeway, they provide distinct capabilities to exert the changes induced by gender-diverse boards. In the following, we argue that less public scrutiny and less rigid organizational and personnel structures enable gender-diverse boards to better thrive in smaller firms.

As previously argued, smaller firms are less visible and therefore less scrutinized by shareholders and stakeholders. While stakeholders are generally expected to be in favor of environmental and social changes, they are also diverse and might advocate different aspects of environmental and social activities. That is, having fewer stakeholders and lower visibility renders more leeway to smaller firms' decision-makers (WU/LIANG/ZHANG 2020), enabling gender-diverse boards to implement their strategic redesign and execute the necessary changes towards environmental and social performance more freely.

The realization of environmentally and socially friendly practices within a firm further requires innovative ideas on 'how to', perception and promotion by upper-scale leaders and the flexibility to carry out changes. Research suggests that firm size plays a role in the generation and implementation of creativity and innovation (DAMANPOUR 2010; GONG/ZHOU/CHANG 2013). The smaller and less complex a firm is, the fewer competing tasks and duties require the directors' attention (GONG/ZHOU/CHANG 2013; PFEFFER/SALANCIK 1978; WICKERT/SCHERER/SPENCE 2016) and the more likely it is that gender-diverse boards will be able to dedicate their cognitive capacities and efforts towards environmental and social performance. Less rigid organizational structures in smaller firms facilitate innovation (DAMANPOUR 2010) and allow for higher flexibility in the implementation process due to lower levels of bureaucracy, reduced coordination costs and fewer information asymmetries (CHEN et al. 2017; DOBREV/KIM/CARROLL 2003; JOSEFY et al. 2015; WICKERT/SCHERER/SPENCE 2016), favoring environmental and social performance-changing adjustments.

Smaller firms have fewer human resources, which limits their personnel complexity and thereby facilitates the acceptance and implementation of changes initiated by

the board. Having fewer employees to coordinate enables quicker and easier performance transformations, as firms have lower personnel rigidity. With firm size, the degree of decentralization increases, the number of hierarchical levels rises (BLAU 1968; NELSON/WINTER 1982) and power is distributed amongst an increasingly large number of people (NAHAVANDI/MALEKZADEH 1993; PAPADAKIS 2006). Firm size hence augments a firm's rigidity and inertia (HANNAN/FREEMAN 1977; XIE 2014) and in turn reduces the influence of gender-diverse boards (NAHAVANDI/MALEKZADEH 1993). That is, it is argued that smaller firms have a lower inertia, leaving more room to leaders' discretion (XIE 2014), thus gender-diverse boards have higher leverage. Based on our argumentation, we hypothesize:

H3a: Firm size moderates the relationship between a firm's board gender diversity and environmental performance such that the effect of board gender diversity on environmental performance is larger when firms are smaller.

H3b: Firm size moderates the relationship between a firm's board gender diversity and social performance such that the effect of board gender diversity on social performance is larger when firms are smaller.

2.3 Method and data

2.3.1 Data

We use board gender balancing reforms as an identification strategy to analyze the effect of board gender diversity on firms' environmental and social performance (ANTONAKIS et al. 2010, ANTONAKIS 2017, HILL et al. 2021). The literature employing reforms as quasi-natural experiments has been growing over the past years, making it a well-established approach to empirically limit the various sources of endogeneity (e.g. BENNOURI et al. 2020, DYCK et al. 2023, YANG et al. 2019).

Our sample comprises all leading publicly listed firms from European countries, including seven countries with mandatory board gender balancing reforms in place until 2015 (Belgium, France, Germany, Italy, the Netherlands, Norway, and Spain). The post-treatment observations of the latter serve as treatment group, while their pre-treatment observations as well as all firms from non-treated European countries serve as control group. After a common trend analysis of the outcome variables within the sample, we keep firms up to 3 years prior and 6 years after the implementation of the

respective reforms. The final sample spans from 2003 to 2019. In line with recent board gender diversity literature, we exclude firms from the financial sector (e.g. GUPTA/CRILLY/GRECKHAMER 2020; MATSA/MILLER 2013; YANG et al. 2019). Due to missing data on our dependent variables, neither sample includes observations from Iceland, despite the introduction of a board gender balancing reform in 2010.

We use the Asset4 database to measure firms' social and environmental performance (AOUADI/MARSAT 2018; CHENG/IOANNOU/SERAFEIM 2014; DREMPETIC/KLEIN/ZWERGEL 2020; GUPTA/CRILLY/GRECKHAMER 2020; HAWN/IOANNOU 2016; IOANNOU/SERAFEIM 2012; SURROCA et al. 2020). The Asset4 database offers ESG data on 9,000 public companies worldwide, of which more than 2,100 are located in Europe. Since 2002/2003 Asset4's research analysts collect the ESG data from publicly available sources, such as annual and CSR reports and from firm websites, as well as from third parties, such as stock exchange, news outlets, and NGOs. To the best of our knowledge, the database offers the most disaggregated data on ESG measures on the market (DYCK et al. 2023). Asset4 progressively expands as new indices are included, and it is continuously updated to incorporate the newest information, e.g., controversies covered by global media. A major advantage of using ESG performance scores provided by Asset4 lies in the granularity, transparency, and data-driven logic. The data comprises more than 500 nuanced boolean (yes/no) and numeric measures and is therefore especially well-suited to study our research question compared to the ESG scores provided by other databases. The environmental and social performance scores are calculated with 68 and 62 measures respectively. Those are grouped into categories, e.g. 'emissions', 'innovation' and 'resource group' for environmental performance, which are then translated into percentile scores within industries and summed up to a category score between 0 and 100. To calculate the final environmental and social performance scores, these categories are weighted by industry to account for their specific relevance within an industry. For instance, emissions are a more sensible subject in the mining industry than in media and publishing and are thus emphasized in the score of the respective firms. (REFINITIV 2021).

We combine the Asset4 data with detailed firm level information such as firm size through Thomson/Refinitiv. To this combined dataset, we add board level measures from BoardEx (AHERN/DITTMAR 2012; BENNOURI/DE AMICIS/FALCONIERI 2020;

CLARK/ARORA/GABALDON 2022; MATEOS DE CABO et al. 2022; YANG et al. 2019). BoardEx provides information on major board characteristics of non-executive directors such as gender composition, board size, board tenure, average age, nationality mix, and education. Overall, our sample covers 7,253 firm-year observations of 990 firms between 2003 and 2019.

2.3.2 Measures

Dependent variable

We use firms' environmental and social performance scores from Asset4 as our main dependent variables. These scores are frequently used in the literature (AOUADI/MARSAT 2018; CHENG/IOANNOU/SERAFEIM 2014; DREMPETIC/KLEIN/ZWERGEL 2020; GUPTA/CRILLY/GRECKHAMER 2020; HAWN/IOANNOU 2016; IOANNOU/SERAFEIM 2012; SURROCA et al. 2020) and enjoy high credibility by experts (RAHDARI/ROSTAMY 2015). *Environmental performance* is measured in terms of the sub-scores capturing firms' emissions, innovations, and resource use. *Social performance* is determined by sub-scores on community, human rights, product responsibility, and workforce. Both scores range between 0-100.

In robustness checks, we also use the *CO2* emissions (DREMPETIC/KLEIN/ZWERGEL 2020) as an alternative measure for environmental performance as well as *injuries* and *donations* (FIECHTER/HITZ/LEHMANN 2022) as alternatives for social performance to show that our results do not qualitatively change when using more direct outcome measures. Because recent empirical findings suggest that environmental and social performance scores from Asset4 also improve through better *CSR reporting* (DREMPETIC/KLEIN/ZWERGEL 2020) and *CSR training* (FIECHTER/HITZ/LEHMANN 2022), we further check that our results are not solely driven by reporting effects or CSR training in the robustness check.

Treatment variable

The dummy variable *post reform* serves as treatment variable. It captures the staggered implementation of board gender balancing reforms throughout Europe. Specifically, we use the introduction of board gender balancing reforms (Norway in 2006, Spain in 2007, Belgium, France and Italy in 2011, the Netherlands and Germany in

2015) [3] (TERJESEN/AGUILERA/LORENZ 2015). The variable takes the value of one for any firms in countries where a board gender balancing reform is in place in the respective year and zero otherwise.

The board gender balancing reforms were implemented to promote female representation at the highest levels of firms, and to push gender equality by improving board gender diversity. While board gender diversity should increase after board gender balancing reforms (BENNOURI/DE AMICIS/FALCONIERI 2020; TERJESEN/AGUILERA/LORENZ 2015), for robustness we also directly measure the effect of *board gender diversity (BGD)*. We do so by using Blau's index with respect to the share of women and men as non-executive directors in boards. This variable ranges from 0 to 0.5 (ZHANG 2020), the latter signifying that male and women directors are fully balanced.

Contextual variable

We use *firm size (inv.)* as contextual variable to analyze its direct and moderating role. We follow previous literature (BALDINI et al. 2018; CHENG/IOANNOU/SERAFEIM 2014; DREMPETIC/KLEIN/ZWERGEL 2020; MITRA/POST/SAUERWALD 2021) and measure firm size by the natural logarithm of a firm's total assets. We invert it by multiplying it with minus one to ease the interpretation of the coefficients. Consequently, the coefficients represent the effects for smaller firms.

To explore the direct and moderating effect of firm size in more detail, we use alternative firm size variables in post-hoc analyses. Following our theoretical arguments, the alternative variables account for the visibility, organizational complexity, personnel complexity, financial slack, and human resource slack of firms. These variables are also inverted to align the interpretation of the coefficients with our main model. Following the literature (BLANKESPOOR/DEHAAN/MARINOVIC 2020; BUSHEE/MILLER 2012), we measure firm visibility with *analysts (inv.)*, as the natural logarithm of the number of analysts forecasting the earnings per share of a firm, and *media (inv.)*, as the natural logarithm of the number of articles mentioning a firm each

[3] Norway introduced the voluntary quota in 2003 but then adjusted the reform in 2006 by making the quota mandatory. That is why we decided to use 2006 (e.g. Yang et al. 2019b).

year. We account for complexity with *segments (inv.)*, i.e. the number of business segments in which a firm operates. To explore the role of personnel complexity, we use *employees (inv.)* as the natural logarithm of a firm's full- and part- time employees. Financial slack is captured with *free cash flow (inv.)*, scaled by total assets to assess firms' relative liquidity. Lastly, *HR slack (inv.)* is defined as the difference between firms' full-time equivalent of employees and the median full-time equivalent in their respective business sector, relative to sales (ADOMAKO/NGUYEN 2020; MELLAHI/WILKINSON 2010; VOSS/SIRDESHMUKH/VOSS 2008).

Control variables

We control for board-level variables that might potentially have confounding effects on the environmental and social performance. We use *board size* (AHERN/DITTMAR 2012; ECKBO/NYGAARD/THORBURN 2021; MATSA/MILLER 2013; SOLAL/SNELLMAN 2019) as a proxy for the available manpower and amount of cognitive perspectives a board has as its disposition to advance its agenda. We use *tenure* measured as the average tenure of non-executive board members' years on the board to account for their knowledge and experience (AHERN/DITTMAR 2012; TRIANA/MILLER/TRZEBIATOWSKI 2014). We control for *age*, taken as the average age of non-executive directors (AHERN/DITTMAR 2012; MATSA/MILLER 2013; SOLAL/SNELLMAN 2019; TRIANA/MILLER/TRZEBIATOWSKI 2014) to alleviate concerns that our treatment effect stems from a potential age effect (i.e. older male board members might have been exchanged by younger female board members). We also account for human capital by including *education* as the average level of non-executive board directors' educational degree measured in terms of the number of their educational degrees above bachelor level (AHERN/DITTMAR 2012). Lastly, we control for *nationality mix*, an index variable that ranges from 0 to 1 to approximate the share of international directors (TRIANA/MILLER/TRZEBIATOWSKI 2014; YANG et al. 2019).

2.3.3 Analysis

We use the staggered implementation of board gender balancing reforms throughout Europe to identify the influence of board gender diversity on firms' environmental and social performance in a staggered Differences-in-Differences (staggered DiD) approach (ATHEY/IMBENS 2022; HOYNES/SCHANZENBACH/ALMOND 2016). Staggered DiD allows to control for firm- and time-specific effects by exploiting an extensive

fixed effects structure and by using each firm before the treatment as its own control as well as all other non-treated firms in the same year. Including firms from non-treated countries as controls in the primary sample alleviates a potential post-treatment trend bias (BAKER/LARCKER/WANG 2022). The staggered DiD (ATHEY/IMBENS 2022) isolates the effect of board gender balancing reforms on the environmental and the social performance from other static firm, industry, and country level determinants, such as technological advancements and differences in country or firm level social contexts (ZHANG 2020). Furthermore, it teases out the effects independently of the general time trends in the environmental and the social performance which are a key concern in studies on the subject.

In line with AHERN/DITTMAR (2012) and ADAMS (2016), we use firms as our unit fixed effects and years as our time fixed effect. For all regressions that estimate the treatment effect based on *post reform*, we cluster the standard errors on the country level as all firms within a country were simultaneously affected by the respective board gender balancing reform (BERTRAND/DUFLO/MULLAINATHAN 2018). For all regressions that estimate the gender diversity effect using *board gender diversity*, we cluster the standard error on the firm level to account for serial correlation in the time-series (AHERN/DITTMAR 2012). All non-binary variables were standardized with a mean of zero and a standard deviation of one.

Descriptive statistics are provided in Table 2.1. Firm-year observations in our sample show an average *environmental* and *social performance* of 48.30 and 54.39 respectively. With standard deviations of 28.55 and 24.67, there is a large variation in firms' *environmental* and *social performance*. The firm-year observations in our sample show an average *board gender diversity* of 0.27 and a positive correlation of the latter with *post reform*. In line with our expectations, this indicates that the board gender balancing reforms fulfilled their main goal of increasing board gender diversity. Furthermore, we find a positive correlation between our explanatory variable *post reform* and the independent variables *environmental* and *social performance*.

The correlations amongst the control variables are in line with the literature (e.g. (AHERN/DITTMAR 2012; GARCÍA LARA/PENALVA/SCAPIN 2021; MATSA/MILLER 2013; YANG et al. 2019). To verify that our results are not subject to multicollinearity, we estimate the variance inflation factor (VIF) scores. We find VIFs that do not exceed

the value of 1.16, suggesting that multicollinearity is no concern for the validity of our results.

Table 2.1: Summary statistics and correlations

	Variables	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	Environmental performance	48.30	28.55	0	98.44	-								
(2)	Social performance	54.39	24.67	0.31	98.63	0.73*	-							
(3)	Post reform	0.32	0.47	0	1	0.21*	0.26*	-						
(4)	Board gender diversity	0.27	0.18	0	0.5	0.30*	0.32*	0.40*	-					
(5)	Firm size	15.87	0.58	10.63	22.24	0.48*	0.42*	0.02	0.15*	-				
(6)	Board size	10.00	3.93	1	25	0.30*	0.23*	0.08*	0.07*	0.45*	-			
(7)	Tenure	4.66	2.41	0	20.5	0.02	0.02	-0.02	-0.00	0.01	0.05*	-		
(8)	Age	58.25	4.25	37.70	80	0.08*	0.09*	-0.01	-0.11*	0.02	-0.07*	0.33*	-	
(9)	Education	1.88	0.57	0	5	0.11*	0.16*	0.00	0.04*	0.08*	-0.20*	-0.10*	0.11*	-
(10)	Nationality mix	0.33	0.26	0	0.90	0.16*	0.19*	-0.03	0.04*	0.12*	-0.08*	-0.09*	0.15*	0.34*

N=7,253, *p<0.01

2.4 Results

2.4.1 Main results

We test our hypotheses using a multivariate linear regression model with firm- and year fixed effects and the staggered introduction of the board gender balancing reforms throughout Europe as our main explanatory variable (*post reform)*. This variable turns our model to a staggered DiD regression model. We use the interaction term between *post reform* and *firm size (inv.)* to investigate the moderating role of firm size on the treatment effect. Our main results are reported in Table 2.2.

Table 2.2: Main results

Dependent variable=	Model 1 Board gender diversity	Model 2 Envir. perform.	Model 3 Envir. perform.	Model 4 Social perform.	Model 5 Social perform.
Treatment variable					
Post reform	0.463***	-0.011	0.020	0.031	0.062
	(0.108)	(0.044)	(0.042)	(0.060)	(0.061)
Moderator variable					
Firm size (inv.)			-0.240***		-0.148**
			(0.046)		(0.053)
Interaction					
Post reform * Firm size (inv.)			0.137***		0.138***
			(0.033)		(0.029)
Controls					
Board size	0.102***	0.050	0.023	0.051	0.035
	(0.027)	(0.034)	(0.033)	(0.031)	(0.030)
Tenure	-0.034	-0.006	-0.006	0.035**	0.037**
	(0.026)	(0.013)	(0.013)	(0.017)	(0.016)
Age	-0.123***	0.007	-0.004	-0.008	-0.017
	(0.025)	(0.022)	(0.021)	(0.026)	(0.027)
Education	0.028	0.024	0.012	0.052***	0.043**
	(0.032)	(0.015)	(0.017)	(0.019)	(0.020)
Nationality	-0.012	-0.019	-0.020	-0.007	-0.006
	(0.029)	(0.017)	(0.019)	(0.019)	(0.020)
Firm fixed effect	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Observations	7,253	7,253	7,253	7,253	7,253
R-squared	0.547	0.554	0.562	0.539	0.543
Number of firms	990	990	990	990	990

Notes: This table reports results of a staggered difference-in-differences regression. Standard errors in parentheses are clustered by countries. *** p<0.01 ** p<0.05 * p<0.1

In Model 1, we test whether the introduction of gender balancing reforms increases board gender diversity. Our results show that, indeed, there is a statistically significant, positive relation (β=0.463; p<0.01) between *post reform* and *board gender*

diversity. This result suggests that the observed board gender balancing laws were effective in increasing board gender diversity in non-executive boards.

In Models 2 and 4 of Table 2.2, we investigate the direct effects of the board gender balancing reforms on the environmental and the social performance but find no statistically significant effects. Hence, we find no supporting evidence for H1a and H1b. In Models 3 and 5 we test our full model by including the direct effect of *firm size (inv.)* and its interaction with *post reform*. There, we find negative and statistically highly significant direct effects of the inverted firm size on environmental (β=–0.240; $p<0.01$) and social performance (β=0.148; $p<0.01$). Because the firms size effect of Models 3 and 5 need to be considered in the context of the interaction term, the firm size coefficient shows that smaller firms have lower environmental and social performance compared to their larger peers before the reforms. These results support our hypotheses H2a and H2b and are in line with findings of recent literature (ACABADO et al. 2020; DREMPETIC/KLEIN/ZWERGEL 2020). With respect to our moderation hypotheses, we also find positive and statistically highly significant interaction terms of *post reform* and *firm size (inv.)*, supporting H3a and H3b. These results indicate that especially smaller firms benefit from the board gender balancing reforms in terms of their environmental (β=0.137; $p<0.01$) and social performance (β=0.138; $p<0.01$) and stress the need to consider the context-dependence when evaluating the implications of board gender balancing reforms for environmental and social performance. In the following sections, we test the robustness of our findings by changing the specifications of our main variables and exploring alternative explanations for our results.

2.4.2 Robustness checks

Alternative treatment specification

Since the various countries in our sample introduced distinct types of board reforms, our *post reform* variable constitutes a very general approximation of the actual board gender diversity effect of firms. Therefore, we re-estimate Table 2.2 and exchange the binary *post reform* variable with a continuous measure of *board gender diversity* (Blau's index) in Table 2.3 (ZHANG 2020) with clustered standard errors on the firm level.

In Models 6 through 9, we find that our main results remain qualitatively unchanged if we use the actual *board gender diversity* as our main treatment variable

instead of the *post reform* variable. While we lose some significance in Model 9, the models overall corroborate our main results regarding H2a, H2b, H3a and H3b. Hence, our findings are unaffected irrespective of using a binary policy treatment variable or a continuous measurement of board gender diversity.

Table 2.3: Main results with board gender diversity measure

Dependent variable=	Model 6 Envir. perform.	Model 7 Envir. perform.	Model 8 Social perform.	Model 9 Social perform.
Explanatory variable				
Board gender diversity (BGD)	-0.006	-0.016	0.016	0.010
	(0.018)	(0.018)	(0.021)	(0.021)
Moderator variable				
Firm size (inv.)		-0.188***		-0.096
		(0.054)		(0.060)
Interaction				
BGD * Firm size (inv.)		0.048***		0.034**
		(0.014)		(0.017)
Board controls & Firm & Year FE	Yes	Yes	Yes	Yes
Observations	7,253	7,253	7,253	7,253
R-squared	0.554	0.561	0.539	0.541
Number of firms	990	990	990	990

Notes: This table reports results of a staggered difference-in-differences regression. Standard errors in parentheses are clustered by firms. *** p<0.01 ** p<0.05 * p<0.1

To visualize the moderating effect of firm size, Figures 2.1 and 2.2 display the post-estimation interaction effects of firm size and board gender diversity on the environmental and social performance respectively, where board gender diversity is measured with Blau's index and firm size is a dummy split at the yearly average. For both larger (upper 50%) and smaller firms (lower 50%), we find that environmental and social performance monotonously increase with board gender diversity. As per H2a and H2b and as insinuated by the direct effect of *firm size (inverted)* in our regression results, larger firms start off at higher performance levels. However, as hypothesized in H3a and H3b, smaller firms benefit more extensively from increasing board gender diversity, which is visualized by the converging performances of smaller and larger firms as the boards become more gender diverse.

Previous studies have neglected to differentiate board gender diversity from the share of women directors, because women-dominated boards make up a minority.

Apart from our theoretical arguments, we also want to empirically rigorously distinguish between the constructs to corroborate our findings in that gender-diverse boards, i.e. boards with the highest possible equality in male and female representation, and not women-dominated boards, i.e. gender-homogenous boards, are most beneficial to smaller firms. To highlight that the diversity of board members and not only the share of women directors leads to our empirical findings, we plotted Figures 2.3 and 2.4 as post-estimations of the regression while exchanging *board gender diversity* by the share of women. The figures show that, especially for smaller firms, environmental and social performance decrease after peaking at a share of women directors of 40 to 60 percent, which would translate into the highest gender diversity. Based on these figures, we are confident that our findings indeed reflect the consequences of an increased board gender diversity rather than of a higher share of women directors.

Figure 2.1: Post-estimation plot of environmental performance by board gender diversity

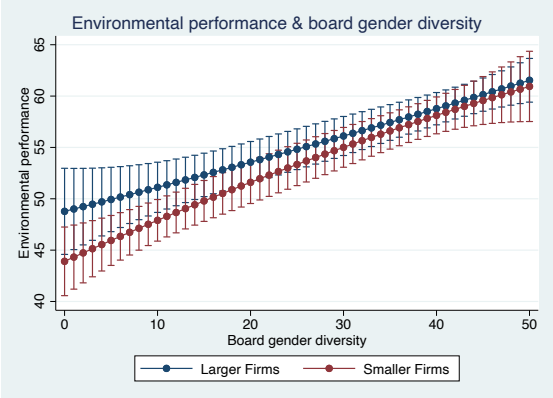


Figure 2.2: Post-estimation plot of social performance by board gender diversity

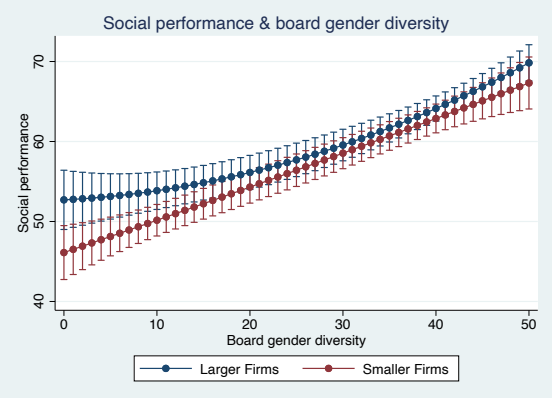


Figure 2.3: Post-estimation plot of environmental performance by share of women directors

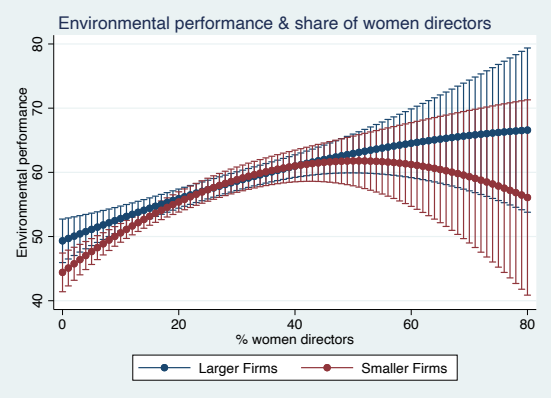


Figure 2.4: Post-estimation plot of social performance by share of women directors

Alternative environmental and social performance measures

While the Asset4 ESG scores have frequently been used as sustainable performance measures in prior empirical research, we want to investigate how robust our results are to changes in our dependent variables. Even though the Asset4 analysts are trained in objective data collection, a subjective assessment of the available information by the raters cannot be fully excluded. We therefore resort to objectively quantifiable ratios which are not subjugated to subjective evaluation, more directly observable and as a result potentially less biased. We replace the environmental performance with the variable *CO2*, which corresponds to firms' estimated total emission of CO_2 and equivalent gases in tons, scaled by market valuation. As alternative variables for social performance, we use *injuries* and *donations* (FIECHTER/HITZ/LEHMANN 2022). The former indicates the percentage of illnesses, injuries, and deaths of employees and contractors that are work-related and is scaled by one million working hours. The latter captures the sum of cash and in-kind donations effectuated by firms, scaled by total assets. As *CO2* and *injuries* have a negative polarization, we expect the signs of the coefficients for our treatment and moderation variable to turn in comparison to our main findings. All three dependent variables are winsorized to limit biases due to outliers.

Table 2.4: Main results with direct measurement of dependent variables

Dependent variable=	Model 10 CO2	Model 11 Injuries	Model 12 Donations
Treatment variable			
Post reform	-0.003	0.058	0.053
	(0.075)	(0.077)	(0.053)
Moderator variable			
Firm size (inv.)	0.032	-0.077	0.079
	(0.065)	(0.129)	(0.066)
Interaction			
Post reform * Firm size (inv.)	-0.028*	-0.090**	0.069**
	(0.014)	(0.033)	(0.034)
Board controls & Firm & Year FE	Yes	Yes	Yes
Observations	4,878	2,161	2,472
R-squared	0.020	0.194	0.020
Number of firms	743	505	420

Notes: This table reports results of a staggered difference-in-differences regression. Standard errors in parentheses are clustered by countries. *** p<0.01 ** p<0.05 * p<0.1

Models 10-12 of Table 2.4 display the results of our regressions on *CO2*, *injuries* and *donations* respectively. The direct effect of *post reform* remains insignificant in all models, and the direct effect of *firm size (inv.)* turns insignificant as well. However, the moderation effect is statistically significant regardless of the specification and holds the expected signs. Models 10 and 11 show that CO_2 emissions (β=–0.028; $p<0.1$) and work-related injuries (β=–0.090; $p<0.05$) decrease in smaller firms after the enforcement of the gender balancing reforms, and Model 12 hints at a post-reform increase in donations (β=0.069; $p<0.05$) in smaller firms. The decreasing statistical power in Models 10-12 is neither concerning nor surprising, because the limited data availability substantially reduces the sample sizes compared to our main models. Therefore, we take these results as supporting evidence for H3a and H3b.

CSR reporting and CSR training as alternative explanations

In our main specification, we interpret the treatment effect as the effect of board gender balancing reforms on the environmental and social performance of smaller firms. FIECHTER/HITZ/LEHMANN (2022) have shown that CSR-related reforms can simultaneously affect both CSR reporting and actual CSR performance of firms. Literature also argues that gender-diverse boards can enhance reporting quality (DIENES/VELTE 2016; FERNANDEZ-FEIJOO/ROMERO/RUIZ-BLANCO 2014; FRIAS-ACEITUNO/RODRIGUEZ-ARIZA/GARCIA-SANCHEZ 2013; LIAO/LUO/TANG 2015; RAO/TILT 2016). Considering these insights, we investigate to what extent our findings are driven by CSR reporting and CSR training, to corroborate that our main results refer to actual environmental and social performance changes.

To separate the performance effect from the reporting effect, we run additional analyses using two measures for CSR reporting (quantity and quality). First, we use the percentage of data points entering the Asset4 environmental and social scores available for the firms to account for their *CSR reporting (quantity)* (DREMPETIC/KLEIN/ZWERGEL 2020). Second, we capture *CSR reporting (quality)* by adopting the measure by FIECHTER/HITZ/LEHMANN (2022), which yields a score between zero and three, counting whether a firm has implemented a CSR committee, CSR training and (top) management CSR pay policies.

Board gender balancing reforms interfere with firms' corporate governance structures. FIECHTER/HITZ/LEHMANN (2022) propose *CSR training* as one alternative outcome of CSR-related legal changes with environmental and social implications. For this purpose, we measure *CSR training* as a dummy variable that takes the value of one if a firm either offers environment management training for employees, health and safety training for executives and key employees or CSR training for suppliers (FIECHTER/HITZ/LEHMANN 2022).

In Models 13-15 of Table 2.5, we re-run our main regression but exchange the dependent variables with the three abovementioned reporting and training variables to validate the effects of gender balancing reforms and firm size. In all three models, *firm size (inv.)* is negatively associated with the CSR reporting and training standards, meaning that smaller firms have lower levels of the latter. The interaction with *post reform* shows that gender balancing reforms positively influence the CSR reporting quality, quantity and training. However, this effect is only statistically significant for the CSR reporting quality in Model 14 ($\beta=0.191$, $p<.01$). Interestingly, Model 14 also shows a significant positive direct effect of board gender balancing reforms on the CSR reporting quality ($\beta=0.184$, $p<.05$), a finding in line with (FIECHTER/HITZ/LEHMANN 2022).

Table 2.5: CSR reporting, training and environmental/social performance

Dependent variable=	Model 13 CSR Reporting (Quantity)	Model 14 CSR Reporting (Quality)	Model 15 CSR Training	Model 16 Envir. perform.	Model 17 Social perform.
Treatment variable					
Post reform	0.092	0.184**	-0.049	-0.041	-0.004
	(0.057)	(0.084)	(0.044)	(0.032)	(0.036)
Moderator variable					
Firm size (inv.)	-0.081**	-0.217***	-0.154***	-0.151***	-0.044
	(0.032)	(0.058)	(0.039)	(0.033)	(0.042)
Interaction					
Post reform * Firm size. (inv.)	0.027	0.191***	0.007	0.098***	0.087**
	(0.029)	(0.051)	(0.041)	(0.020)	(0.039)
CSR Reporting (Quantity)				0.484***	0.403***
				(0.024)	(0.041)
CSR Reporting (Quality)				0.129***	0.206***
				(0.017)	(0.014)
CSR Training				0.138***	0.173***
				(0.015)	(0.027)
Board controls & Firm & Year FE	Yes	Yes	Yes	Yes	Yes
Observations	7,253	7,253	7,253	7,253	7,253
R-squared	0.817	0.590	0.470	0.673	0.654
Number of Firms	990	990	990	990	990

Notes: This table reports results of a staggered difference-in-differences regression. Standard errors in parentheses are clustered by countries. *** p<0.01 ** p<0.05 * p<0.1

In Models 16 and 17 we explore to which extent our main results are driven by changes in CSR reporting and CSR training. To do so, we add *CSR reporting (quantity)*, *CSR reporting (quality)* and *CSR training* as additional control variables to our main regression models. Given the preceding results, it is not surprising that all three controls are statistically significantly positively associated with environmental (Model 16) and social performance (Model 17). Nevertheless, we still find that smaller firms have lower levels of environmental performance (β=–0.151, p<.01) and social performance (β=–0.044, n.s.) prior to the board gender balancing reforms and, most importantly, that gender balancing reforms regardless of the alternative explanations have a significant positive effect on the environmental performance (β=0.098, p<.01) and social performance (β=0.087, p<.05) of smaller firms.

Based on this robustness check, we are confident that our main findings are only partially explained by CSR reporting and training effects, and that they indeed reflect actual environmental and social performance improvements in smaller firms.

Graphical post-hoc results

We created post-estimations graphs using a binary firm size variable, splitting the firms at the mean, in Figures 2.5 and 2.6 to visualize the implications of the policy treatment effect on the environmental and social performance over time.

Figure 2.5: Post-estimation plot of environmental performance over treatment time

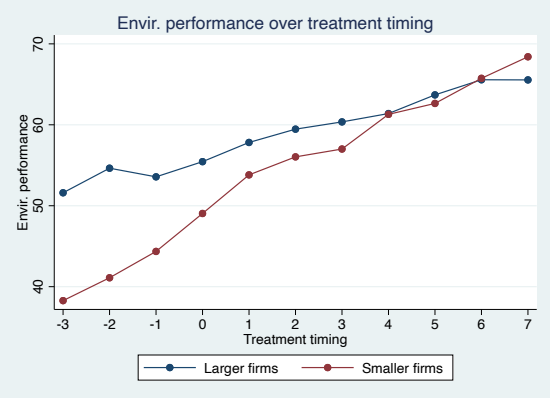
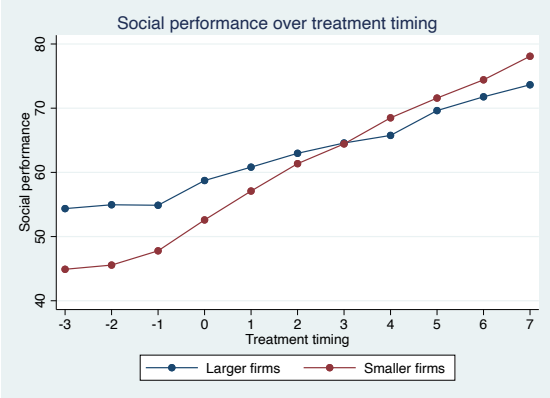


Figure 2.6: Post-estimation plot of social performance over treatment time



Consistent with our estimations and previous figures, Figure 2.5 shows that larger firms start off at higher levels of environmental performance than smaller firms and experience a raise as the gender balancing reforms are enacted. Smaller firms, however, undergo a steeper post-treatment increase in environmental performance and even overtake their larger peers over time. Figure 2.6 illustrates a similar pattern for social performance, with larger firms starting off at higher levels and a subsequent increase for all firms after the introduction of gender balancing reforms. Their social performance converges, whereas, starting in the third post-treatment year, smaller firms slightly outperform larger firms.

2.4.3 Exploration of the mechanisms that drive the firm size moderation

To explore mechanisms that drive the effect of firm size in a more nuanced way, we run additional analyses based on our theoretical reasoning and the underlying literature in the following part. Table 2.6 displays the results.

Visibility

Larger firms tend to be more visible to the public than smaller firms: they are of higher relevance to public institutions and governments due to their economic and overall impact on society and have a larger number of stakeholders. They are therefore under particular scrutiny and need to adhere more strongly to expectations held by the general public, including a sustainable management, to maintain legitimacy (ZHANG 2020). Visibility also provides numerous and stronger ties to external stakeholders, grants better access to financial and informational resources (WU/LIANG/ZHANG 2020), and increases the benefits they can obtain from engaging in sustainable activities (JOSEFY et al. 2015; ZHANG 2020).

Conversely, less visible firms might benefit more extensively from gender balancing reforms. They face less scrutiny by shareholders and stakeholders and consequently have more leeway in enforcing sustainable change, which requires short-term, sometimes rather risky investments that might be more critically assessed under higher scrutiny (WU/LIANG/ZHANG 2020). While their lower visibility might put them at initially lower environmental and social performance levels, smaller firms have more to gain from the effects of gender-diverse boards. That is, we would expect more visible firms to have higher levels of environmental and social performance, but less visible firms to have higher returns on environmental and social performance upon the introduction of the reforms. The findings for the variables *analysts (inv.)* and *media (inv.)* are displayed in Models 22 and 23, and in Models 24 and 25 respectively.

We find a statistically significant direct effect of firm visibility in Models 22, 24 and 25, indicating that larger, more visible firms have higher environmental and social performance. This finding resonates with our direct effect of firm size in the main results and indicates that part of the firm size effect may be attributable to a firm's visibility. With respect to the moderation, except for Model 23, we find no statistically significant interaction coefficient, suggesting that positive effect of board balancing reforms on environmental and social performance of smaller firms is not driven by their visibility.

Table 2.6: Exploration of the firm size effect

	Model 22	Model23	Model 24	Model 25	Model 26	Model 27	Model 28	Model 29	Model 30	Model 31	Model 32	Model 33
Dependent variable=	Envir. perform.	Social perform.	Envir. perform.	Social perform.	Envir. perform.	Social perform.	Envir. perform.	Social perform.	Envir. perform.	Social perform.	Envir. perform.	Social perform.
Size approximation (inv.)	Analysts		Media		Segments		Employees		Free cash flow		HR slack	
Treatment variable												
Post reform	0.047	0.141**	0.013	0.062	0.027	0.071	0.005	0.046	-0.017	0.026	-0.017	0.024
	(0.072)	(0.056)	(0.045)	(0.064)	(0.051)	(0.066)	(0.043)	(0.062)	(0.045)	(0.058)	(0.041)	(0.058)
Moderator variable												
Size (inv.)	-0.068**	-0.015	-0.026***	-0.032***	-0.012	-0.054**	-0.014	-0.064*	-0.029*	-0.039	0.062***	0.026*
	(0.030)	(0.042)	(0.005)	(0.007)	(0.020)	(0.020)	(0.055)	(0.036)	(0.016)	(0.023)	(0.022)	(0.014)
Interaction												
Post reform * Size (inv.)	0.035	0.073**	0.011	0.014	0.066**	0.073***	0.054***	0.049***	0.061	0.050	-0.034**	-0.047***
	(0.039)	(0.029)	(0.007)	(0.016)	(0.031)	(0.019)	(0.014)	(0.016)	(0.040)	(0.049)	(0.015)	(0.015)
Board controls & Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,253	7,253	7,253	7,253	7,253	7,253	7,253	7,253	7,132	7,132	7,250	7,250
R-squared	0.555	0.539	0.557	0.542	0.555	0.540	0.556	0.540	0.556	0.541	0.556	0.539
Number of Firms	990	990	990	990	990	990	990	990	990	990	990	990

Notes: This table reports results of a staggered difference-in-differences regression. Standard errors in parentheses are clustered by countries. *** p<0.01 ** p<0.05 * p<0.1

Organizational complexity: segments

Another relevant difference between larger and smaller firms is their organizational complexity, especially regarding their organizational segmentation. On the one hand, larger firms offer a multitude of goods and services and might already have accumulated a rather wide range of cognitions and perspectives compared to smaller firms, since they need to cover the diverging requirements of each of these segments (GONG/ZHOU/CHANG 2013). As argued in our theoretical chapter, such a variety of cognitions might positively influence environmental and social performance due to a more adaptive response repertoire and innovative thinking (HE/JIANG 2019; NADEEM et al. 2020; POST/RAHMAN/MCQUILLEN 2015). Moreover, acting in a diverse spectrum of product and service lines increases the number and diversity of stakeholders tied to a firm, which – following stakeholder theory – puts these firms under pressure to invest in social and environmental measures (DUQUE-GRISALES/AGUILERA-CARACUEL 2021).

On the other hand, smaller firms with lower segmentation might be in a favorable position upon the introduction of gender balancing reforms. Gender-diverse boards might benefit from the lower complexity, because a smaller spectrum of issues requires their attention, such that they can better focus their attention and oversight capacities on the enhancement of environmental and social performance (GONG/ZHOU/CHANG 2013; PFEFFER/SALANCIK 1978; WICKERT/SCHERER/SPENCE 2016). Lower complexity also comes along with lower inertia to change implementation as a response to higher board gender diversity, due to fewer information asymmetries, lower coordination costs, higher shared identity and less bureaucracy along business units and hierarchical structures (CHEN et al. 2017; DOBREV/KIM/CARROLL 2003; JOSEFY et al. 2015; WICKERT/SCHERER/SPENCE 2016). The smaller the structural distance between the gender-diverse boards that develop a sustainability strategy and their decentralized business units, where the strategy is ultimately implemented, the fewer problems might arise due to misunderstandings or resistance. Hence, we would expect more complex firms to have higher levels of environmental and social performance, but smaller, less complex firms profit more in terms of environmental and social performance from the gender balancing reforms.

The coefficient size of the direct effect of the segmentation indeed point towards lower (higher) levels of environmental and social performance in less (more) complex firms, however, these are statistically insignificant except in Model 27 (β=–0.054, p<.05). Thus, we only find tentative evidence for the direct role of segmentation for environmental and social performance of firms. In contrast, we find strong support for the moderation effect, i.e., that less complex firms' environmental (β=0.066, p<.05) and social performance (β=0.073, p<.01) increase more after the implementation of the gender balancing reforms, which speaks to our arguments of attention and inertia.

Personnel complexity: human resources

A firm's complexity is also reflected in its human resources, that ultimately must implement the firm's sustainability strategy. Larger firms with more human resources can exploit economies of scale to realize their environmental and social goals (JOSEFY et al. 2015).

While smaller firms might have fewer employees, their reduced personnel complexity might come in handy in times of change, i.e., a strategic shift following the introduction of a more gender-diverse board. The reorganization of functional processes should be easier in these firms since they might be less susceptible to coordination difficulties or disturbances in the informational flow. Additionally, fewer human resources means that there are fewer potential resistors to change hampering the improvement of the environmental and social performance. Thus, we would expect similar findings for personnel complexity as compared to the previous ones in terms of organizational complexity.

Similarly, to our findings regarding organizational complexity, the coefficients hint at higher levels of environmental and social performance in firms with more employees, but lack in statistical significance. In contrast, the highly significant, positive interaction coefficients support our argument that firms with lower personnel complexity particularly profit from the reforms in terms of their environmental (Model 28, β=0.054, p<.01) and social performance (Model 29, β=0.049, p<.01).

Financial slack

Financial slack describes the financial resources available in a firm exceeding its financial needs. We suspect that the potentially higher availability of financial slack in

larger firms generally induces classical principal-agent problems on a managerial level. For instance, managers might want to use these resources to serve their own rather myopic agenda to maximize their own utility, instead of investing them in long-term beneficial organizational goals such as environmental and social outcomes (LEYVA-DE LA HIZ/FERRON-VILCHEZ/ARAGON-CORREA 2019; MELLAHI/WILKINSON 2010).

However, having only little financial slack, as might be the case in smaller firms, could hinder gender-diverse boards' strategy towards the development of environmentally and socially friendly goods and services, because less financial slack restricts the possibilities for experimentation and development of such innovative products (ADOMAKO/AHSAN 2022). Furthermore, considering little financial slack, even gender-diverse boards might see the need to prioritize the firm's survival and shift the focus to operational activities and could thus inhibit their wish to set up an environmentally and socially friendly strategy all together. Given the abovementioned arguments, we suspect that larger firms with more financial slack might have a worse baseline environmental and social performance. Simultaneously, they might experience higher returns from the introduction of gender balancing reforms than smaller firms with less financial slack, since the latter face more financial adversities in the implementation of an environmentally and socially favorable strategy.

When using financial slack as an alternative moderator variable, we find no significant direct and moderating effect (Models 30 & 31) of financial slack on a firm's environmental and social performance. Hence, in our empirical setting financial issues might be less of a boundary condition for environmental and social performance than commonly believed.

Human resources slack

Finally, recent literature argues that not only the general availability of human resources might influence environmental and social performance, but that the degree of excess human resources beyond the firms' basic operative needs might play a role (ADOMAKO/NGUYEN 2020). Firms with more HR slack are more capable to acquire economic and technical information needed for environmental and social innovation, and high HR slack fosters the organizational innovation culture (ADOMAKO/NGUYEN 2020). This sets firms up for a generally high environmental and social performance.

Additionally, to implement a gender-diverse boards' sustainability strategy, it is crucial to have excess human resources. The human resources dedicated to sustaining a firm's operative functioning do not have the necessary time to take on the additional workload to exert environmental and social changes (MELLAHI/WILKINSON 2010). Hence, having an HR abundance could favor the willingness of employees to comply with changes, because it does not come along with excess workload, and the actual ability realize changes (ADOMAKO/NGUYEN 2020). Moreover, supervisors with slack HR at their disposal might me more reluctant to give leeway for sustainable experimentation and innovation to their subordinates to exert the board's strategy (MELLAHI/WILKINSON 2010). That is, we presume that firms with a lot of HR slack will have higher baseline environmental and social performance and will be better able to even improve these after the changes coming along with the gender balancing reforms.

Contrary to our expectation, Models 32 and 33 provide empirical evidence that firms with less HR slack are associated with higher levels of environmental (β=0.062, $p<.01$) and social performance (β=0.026, $p<.1$). However, the introduction of gender balancing reforms seems to be indeed less beneficial for environmental (β=–0.034, $p<.05$) and social performance (β=–0.047, $p<.01$) in firms with less HR slack compared to those with more HR slack.

2.5 Discussion

2.5.1 Key empirical findings

In this paper, we established and tested six hypotheses, four of which are corroborated by our empirical findings. We hypothesized there would be a positive direct effect of board gender diversity on environmental (H1a) and social performance (H1b), neither of which is supported by our results. Instead, such an effect is only found when we consider firm size as a context variable. We find supporting evidence that firm size is directly related to environmental (H2a) and social (H2b) performance in a way that larger firms are more performative. Interestingly, we find a highly significant moderating effect of firm size on the relation between board gender diversity and environmental (H3a) and social performance (H3b), emphasizing that primarily smaller firms benefit from gender-diverse boards.

We show that these findings are robust to several specification modifications. Exchanging the explanatory variable *post reform*, capturing the introduction of gender balancing reforms, for Blau's index as more direct measure of board gender diversity, yields qualitatively very comparable results. Switching the dependent variables for the more up-front environmental and social outcomes *CO2*, *injuries* and *donations* leads to similar findings, albeit in part at a loss of statistical significance, which might be due to the shortening in observations. Controlling for the potentially confounding effects of CSR reporting and CSR training also produces identical results to our main model.

Lastly, a post-hoc analysis to disentangle the drivers of the firm size effect shows that there are noteworthy differences in the mechanisms. It is striking, for instance, that our specifications for firm visibility (analysts and media coverage) is an important direct antecedent of environmental and social performance, while there is no significant moderating effect. In contrast to this, firm complexity, which we measure with a firm's organizational segmentation and number of employees, yields no convincing evidence for a direct effect on environmental and social performance. Instead, it acts as a key context variable, such that it strongly moderates the impact of board gender diversity on performance, showing that less complex firms profit more heavily from gender-diverse boards.

2.5.2 Theoretical implications

Three theoretical implications can be derived from our findings. For one, we revert to well-established, prevalent arguments from agency theory, upper echelons theory and resource dependence theory to make our case for a direct effect of board gender diversity on environmental and social performance but conclude that there are limitations to their applicability. Contrary to the argumentation, our findings suggest that mere board gender diversity is not sufficient to enhance environmental and social performance, but that its effects are sensitive to organizational factors such as firm size. The proposed theoretical reasoning is hence context-dependent and the aforementioned theories' tenability restricted by contextual boundary conditions.

Building on this, we disentangle firm size as a relevant setting for environmental and social performance and uncover some more nuanced firm contingencies. While the construct of firm size is clear, the underlying mechanisms are theoretically quite

nuanced and, as mentioned earlier, lead to diverging results, e.g. in the case of firm visibility and firm complexity as two distinct aspects of firm size. While, for instance, legitimacy theory offers an explanation to understanding how firm visibility might directly impact environmental and social performance, stakeholder theory and capabilities unique to smaller firms are key arguments why gender-diverse boards can only effectively improve environmental and social performance in less complex, less rigid firms, as insinuated by the moderation. Thus, from a theoretical point of view it is important to reflect various aspects of context variables such as firm size to understand *how* and *why* they lead to disparate outcomes.

Furthermore, previous literature has not always stringently differentiated between gender diversity, i.e. gender heterogeneity, and female representation, i.e. gender homogeneity. We, however, distinctly focus our theoretical reasoning on board gender diversity and provide empirical evidence that – contingent on the context – indeed gender heterogeneity yields the better environmental and social performance, and not the share of women on the boards. This is in line with previous findings (APESTEGUIA/AZMAT/IRIBERRI 2012; BIRINDELLI/IANNUZZI/SAVIOLI 2019; GLASS/COOK/INGERSOLL 2016). Thus, there is a sensitive difference in the theoretical approach towards topics such as gender quotas and their outcomes. While women arguably have distinctive features improving environmental and social performance, such as higher social awareness, they also have detrimental characteristics, such as higher risk aversion, which should be balanced out by male directors to yield optimal outcomes.

2.5.3 Practical implications

Since matters of sustainability are gaining increasing attention from policy makers and stakeholders and are hence becoming more relevant to firms, understanding the practical implications of context contingencies becomes important to provide the best guidance to firms in their striving to adapt to changing demands to remain competitive. We identify firm size as a fundamental direct and moderating factor contributing to enhancing environmental and social performance. First, and in line with recent literature (ACABADO et al. 2020; DREMPETIC/KLEIN/ZWERGEL 2020) our empirics support our theoretical arguments stating that larger firms have higher environmental and social performance, which is, as we show, amongst others related to higher visibility and

the concomitant stakeholder scrutiny. That is, policy makers should be aware of this imbalance to further tighten their grip on smaller firms in particular and increase their accountability. For instance, they could put policies into place that also incentivize smaller firms to increase their interest in environmental and social matters.

Second, research on board gender diversity has so far predominantly concentrated on the financial firm performance implications of an increasing representation of women in boards (ADAMS 2016; KIRSCH 2018; YANG et al. 2019; ZHANG 2020). Instead of following that path, we emphasize that women directors are not better, but different from male directors and as such bring in other viewpoints and foci on a firm's relevancies. These very differences are beneficial to smaller firms' environmental and social performance, which we show by analyzing the latter as a side effect of gender-balancing reforms. This again points out the relevance to accounting for corporate context when implementing policies, as the outcomes can vastly differ between policy targets.

Third, our further explorations of the firm size effect revealed that limited organizational and personnel complexity are possible explanations why smaller firms can reap environmental and social outcome benefits from increasing board gender diversity. That is, larger firms could try to tackle the issues that hinder them from experiencing the same value from gender-diverse boards by exploring ways to reduce detrimental organizational processes hampering the positive effects of gender-diverse boards. For instance, they could keep bureaucratic hurdles low to not exacerbate the existing obstacles of complexity or offer adequate training to employees to sensitize them to environmental and social matters and reduce their opposition to change.

2.5.4 Limitations and future research

One limitation of our study consists in our definition of smaller firms. While they are indeed the smaller ones in our sample, they are still all publicly listed and are hence not necessarily representative for non-listed small and medium enterprises. That is, future research could analyze firms that are either not listed or listed in smaller indices to test whether our findings also hold for even smaller firms.

Furthermore, in an endeavor to rule out CSR reporting and training as sole driver of our findings, we included variables as controls in a robustness check. While our

main findings still hold, we cannot fully exclude that this or other variables are mediators in the relation between board gender diversity and environmental and social performance. Future research should therefore explore mechanisms in this relation in an attempt to understand the dynamics behind the direct effect of board gender diversity on environmental and social performance. We find no empirical evidence for the latter, which could be due to an omitted variable with opposing effects. For instance, the positive direct effect of board gender diversity on environmental and social performance, as reported in previous literature, might be cancelled out by a negative effect of a mediating factor, such as communication barriers or frictions in gender-diverse boards, which might explain the surprising lack of statistical evidence for a direct relation between our explanatory and dependent variables.

As for our moderator firm size, we are limited to explaining the effects of gender-diverse boards in the context of different firms with theoretical arguments for the dynamics at play on these boards. We can only empirically observe the outcome but cannot offer empirical insights to whether the reasons for the favorable effects of board gender diversity in smaller firms are as presented. For instance, we can only argue that gender-diverse boards encounter fewer hindrances in structurally less rigid, smaller firms, but cannot provide empirical evidence for this. Hence, future research could seek to empirically uncover the processes in gender-diverse boards in smaller as compared larger firms to understand *why* those boards are better able to realize significant changes toward environmental and social matters, and whether the empirical findings are in accordance with theoretical arguments. Qualitative research, e.g. in form of interviews conducted with women directors, could be a suitable approach to gain a deeper understanding of the impetus.

Lastly, we provide promising first insights into mechanisms that explain why larger firms have higher initial levels of social and environmental performance, while smaller firms benefit more extensively from increasing board gender diversity. Future research could build on this work and explore further drivers that explain these observations. Getting a deeper understanding of the processes at work can help policy makers as well as firms to tackle hindrances and shape a corporate milieu in which firms of all sizes can prosper environmentally and socially.

3. Board diversity and sustainable performance: one board size to rule them all?

3.1 Introduction

In recent years, environmental and social firm performance has gained significant attention as firms increasingly face pressure to align their business operations with principles of sustainability (AGUILERA et al. 2021). Stakeholders, which range from individual investors and customers to larger entities such as governments and communities – expect firms to go beyond mere financial profitability and commit to addressing societal and environmental issues (WALLS/BERRONE/PHAN 2012). To remain competitively performant in the long-run and avoid penalties for non-compliance with ethical environmental and social standards, firms should thus re-evaluate their resource-allocation to meet the stakeholders' expectations (AGUILERA et al. 2021; WALLS/BERRONE 2017). This has led to a growing body of research investigating the internal factors that promote a firm's environmental and social outcomes, with a particular focus on the role of strategic elements such as corporate governance and corporate boards (AGUILERA et al. 2021; POST/RAHMAN/RUBOW 2011). I address this gap by looking at board diversity and board size as internal board factors relating to environmental and social performance. Since directors can be diverse regarding multiple aspects, I will look at a composite demographic board diversity measure in terms of age, gender and nationality diversity. I tackle the research question whether board diversity is related to environmental and social performance and look at more nuanced aspects of the latter and further explore how this link is moderated by board size. With board diversity being the main explanatory factor in this study, I refrain from analyzing the third aspect of ESG, i.e. firms' governance performance, because it very likely endogenous as board composition itself is an outcome measure of good governance (HARJOTO/JO 2011; JAIN/JAMALI 2016; UNITED NATIONS DEVELOPMENT PROGRAMME 2023).

Board diversity has been analyzed as a key determinant of organizational performance, reflecting its role as a fundamental resource in a firm's strategy. Board diversity in terms of demographic aspects such as gender, age, and nationality, as well as various other less visible specifications such as experience, tenure and education, is increasingly seen as a valuable resource for enhancing firm performance, particularly

in addressing complex, multidimensional issues such as environmental and social issues (BIN KHIDMAT/AYUB KHAN/ULLAH 2020; CHEN et al. 2024; CUCARI/ESPOSITO DE FALCO/ORLANDO 2018; HAFSI/TURGUT 2013; HARJOTO/LAKSMANA/YANG 2019; JOUBER 2021; KHAN et al. 2024; LI/HE 2023; MENICUCCI/PAOLUCCI 2022). However, empirical research on the relationship between board diversity and sustainable performance remains inconclusive, with some studies finding positive associations (BEJI et al. 2021; HARJOTO/LAKSMANA/YANG 2019; JOUBER 2021; KHAN et al. 2024) while others report mixed (CHEN et al. 2024) or even negative results (ISMAIL et al. 2020; KATMON et al. 2019; PAOLONE et al. 2024). This raises important questions about the conditions under which board diversity is most beneficial.

While prior research has typically treated board size as either a control variable or a direct contributor to environmental and social performance (e.g. KATMON et al. 2019; KHAN et al. 2024; PAOLONE et al. 2024), this study proposes that board size plays a more nuanced role. For this purpose, I introduce board size as a potential contextual moderator in the relationship between board diversity and firm outcomes that may help explain the mixed findings.

That is, this paper has two primary goals. First, I want to investigate whether board diversity is positively associated with environmental and social performance. To get a deeper understanding of potential latent drivers of my findings, I will run further analyses on more nuanced environmental and social outcomes to detect potential differences in the sphere of influence of diverse boards. I theoretically approach this undertaking by integrating core aspects of stakeholder theory (FREEMAN 1984) into the resource-based view (BARNEY 1991; TEECE/PISANO/SHUEN 1997; WERNERFELT 1984). Second, I include board size as a moderator to examine the possibility of its enhancing implications for the aforementioned relation, arguing from the resource-based view.

In doing so, this study offers some empirical contributions to the literature. First, I integrate several dimensions of diversity (age, gender and nationality) into one construct and show how this board diversity is related to environmental and social outcomes. This is relevant to understand if it is rather the global board diversity or particular dimensions that help explain the outcomes, and consequently if the lack in one diversity dimension can be made up for by other aspects of diversity. This also delimits

my paper from the previous discussion paper by YANG/DIEDERICH/RIEPE (2024), which limited its scope to board gender diversity.

Second, I explore more nuanced categories of environmental and social performance in an attempt to identify and disentangle potential drivers of the outcomes. This adds to the current literature by offering a deeper understanding of whether there are specific aspects of environmental and social performance that are particularly affected by board diversity, and whether high performance in one category can cancel out the lack in performance in another category when the overall environmental and social performance is assessed. This extends the previous work presented in chapter 2 (YANG/DIEDERICH/RIEPE 2024) by adding more nuanced outcome observations to the more general categories of environmental and social performance.

Third, this paper contributes to the ongoing debate about the optimal configuration of corporate boards by highlighting the contextual importance of board size in shaping the relationship between diversity and sustainability. I show that board size, often treated as a mere control variable or direct contributor to environmental and social outcomes, rather plays a reinforcing role in the presence of board diversity. This alternate consideration of board size sets this study apart from YANG/DIEDERICH/RIEPE (2024) and adds another possible contextual variable to hopefully better understanding environmental and social performance.

The theoretical contributions of this study are twofold. First, I extend the resource-based view by applying it to ESG-related outcomes, positioning board diversity as a strategic internal resource. This is new insofar as it opens up the theory to new aspects of firm performance, while it was restricted to financial performance in the classic version. I thereby follow the call from resource-based view scholars to relate the theory to matters of sustainability. (BARNEY/KETCHEN/WRIGHT 2021; BEAMISH/CHAKRAVARTY 2021)

Second, I adopt a stakeholder perspective by integrating arguments from stakeholder theory into resource-based view. This broadens the understanding on corporate profits, which was limited to financial outcomes in the traditional resource-based view, and acknowledges that stakeholders can both contribute to corporate outcomes and be the beneficiaries of those outcomes. (BARNEY 2018)

Together, these empirical and theoretical contributions improve our understanding of the governance structures that enable firms to perform better environmentally and socially, offering insights for firms and stakeholders interested in fostering sustainable corporate practices.

The theoretical part briefly summarizes the essence of stakeholder theory (FREEMAN 1984) and applies this framework to the relation between board diversity and environmental and social outcomes. I classify the nature of the board of directors as an internal firm resource according to the resource-based view (BARNEY 1991; TEECE/PISANO/SHUEN 1997; WERNERFELT 1984) and show how board diversity in particular is a vital asset to a firm. An OLS regression with firm and year fixed effects based on 2,415 firm-year observations from European listed firms provides supporting evidence for the positive direct link between board diversity and environmental and social performance. Further, I find supporting evidence for the positive moderating role of board size in this relation. A robustness check using lagged explanatory variables additionally corroborates these findings, and more in-depth post-hoc analyses using the individual diversity measures (age, gender and nationality) and nuanced aspects of environmental and social performance explore the drivers of the main findings. However, these estimations produce results that are surprisingly homogenous. Only board age diversity shows contradicting results in the way that it is negatively related to firm environmental and social performance.

The next section provides the theoretical framework and derives the hypotheses. Section 3 on data and method presents the sample composition, variables and empirical strategy used for the analysis. Section 4 offers empirical results starting off with some descriptive statistics, followed by the main findings, a robustness check and further analyses to back up and explore the main results. Section 5 then discusses the findings and contributions and concludes by offering limitations and giving an outlook on future research.

3.2 Theoretical framework

3.2.1 Board diversity and environmental and social outcomes

Stakeholder theory

Stakeholder theory emphasizes the relevance of stakeholders and their role in a firm's success (FREEMAN 1984). FREEMAN defines stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (1984: 46). This hints toward their importance for the firm's well-being and their ability to promote its success, making it highly relevant for a firm to identify crucial stakeholders and consider them in the firm's strategy (KOLK/PEREGO 2014) to justify their decisions to their stakeholders (CLAASSEN/RICCI 2015). To succeed in the long run, firms therefore feel the pressure to go beyond fulfilling their financial responsibilities towards their shareholders and strive to satisfy their stakeholders as well, which implies a shift from an exclusive focus on financial performance to other dimensions that relate to the stakeholders' expectations, i.e. environmental and social performance (KOLK/PEREGO 2014; MCGUIRE/DOW/ARGHEYD 2003).

Stakeholder theorists consider diverse boards as more performant in identifying and fulfilling the demands of a broader range of stakeholders (HARJOTO/LAKSMANA/LEE 2015; KHAN et al. 2024; MANNER 2010), aligning the firm's strategy accordingly (ADAMS/FERREIRA 2009; CARTER et al. 2010; CARTER/SIMKINS/SIMPSON 2003) and thereby improving a firms non-financial and overall performance (LI/HE 2023). It is argued that diverse boards include more diversified competences and knowledge (AGUILERA et al. 2021; PAOLONE et al. 2024) and therefore might have a deeper understanding for multiple stakeholder groups based on own group identification and social capacities (KHAN et al. 2024). HARJOTO/LAKSMANA/LEE (2015) indicate that having diverse boards, by identifying the relevant stakeholders, thus improves the discussion quality, the decision-making process (MONTEIRO/CEPÊDA/DA SILVA 2024) and sustainability management and performance.

Resource-based view

The resource-based view emphasizes the importance of a firms' unique internal resources, which cannot be acquired from outside, but only be shaped and improved within the company to achieve and maintain a sustainable competitive advantage

(BARNEY 1991; ISMAIL/LATIFF 2019). Internal resources are defined as firm characteristics, e.g. organizational processes or available assets, and capabilities, e.g. information or knowledge, that advance a firm's strategy implementation towards more effective and sustainable performance (BARNEY 1991). They are either physical (tangible), human, or organizational (intangible) in nature (BARNEY 1991).

Following the resource-based view, one can classify the board as human capital in that it brings together personnel qualities like experience and intelligence. As a fundamental element of a firm's corporate governance, it is also an organizational resource, as, firstly, directors hold internal and external organizational ties, and secondly, their strategic directives strongly influence the usage of other firm resources, such as financial resources.

The resource-based view characterizes a resource as vital to a firm if it fulfills the four criteria of value, rarity, imperfect imitability and non-substitutability (BARNEY 1991). Following BARNEY, resources are valuable "when they exploit opportunities or neutralize threats" (1991: 106). They are rare when they are not common to many firms, which also holds for a unique and specific combination of human and organizational capital. Especially the strategic aspect of managerial capabilities is a rare resource, in the sense that it is distinctive to, yet required by each successful firm (HAMBRICK 1987). Resources are imperfectly imitable when they cannot be exactly reproduced or copied by other firms, which also includes the social structures within a firm (BARNEY 1991). Lastly, internal resources are crucial to the competitive advantage if they don't have an immediate substitute, i.e. there exists no other resource that could replace it (BARNEY 1991).

Following these criteria, diverse boards are a relevant resource, since the varied perspectives and qualities the directors bring along are valuable in identifying and acting on both a broader spectrum of opportunities and threats posed by the firm's environment. They are rare because they stand out against rather homogenous boards that have a less dispersed set of strategic capabilities and preferences, and not perfectly imitable as high diversity makes it harder to replicate the same combination of unique perspectives. Finally, diverse boards cannot easily be substituted by another resource, as no other organizational organ is in a position to oversee the firm's situation and align its strategy according to the requirements.

While firm resources can be used in a multitude of ways and in several products/services, board diversity might be especially conspicuous as it affects the firm on a greater scale due to its strategic impact on the managerial directives (PAOLONE et al. 2024; TEECE/PISANO/SHUEN 1997; WERNERFELT 1984). The board is a fundamental element of a firm's corporate governance as it is in charge of the firm's overall strategy and the supervision of the executive directors who manage the daily operating business following the strategic guidelines. That is, firms can have a great resource stock, but a true sustainable competitive advantage could be more easily acquired through the capability to detect market changes and a corresponding flexible strategic adaptation, including the re-organization of other resources. Together with the ability to direct and impose the necessary changes, this suggests the importance of diverse boards as a strategy-altering resource (KHAN et al. 2024; TEECE/PISANO/SHUEN 1997).

Adopting a stakeholder perspective in the resource-based view

Resource-based view scholars have long identified diverse boards in its unique composition as an invaluable internal resource (HARJOTO/LAKSMANA/LEE 2015; ISMAIL et al. 2020; KATMON et al. 2019; KHAN et al. 2024; KHAN/KHAN/BIN SAEED 2019), recognizing its heterogeneity as a contribution to gaining a competitive advantage (BARNEY 1991; KATMON et al. 2019). This consents with stakeholder theory in the sense that board diversity comes along with the perception of heterogeneous stakeholders and an according strategic decision-making (ADAMS/FERREIRA 2009; CARTER et al. 2010; CARTER/SIMKINS/SIMPSON 2003; FREEMAN/DMYTRIYEV/PHILLIPS 2021; HARJOTO/LAKSMANA/LEE 2015). Understanding a variety of stakeholders and their needs is part of a successful market analysis and could lead to more environmentally and socially responsible strategies, because it might be in the firm's interest to act – if deemed relevant enough and feasible – in accordance with its stakeholders or try to reconcile their varied aspirations to sustain a long-term, sustainable competitive advantage (BARNEY 2018; FREEMAN/DMYTRIYEV/PHILLIPS 2021). Looking onto the resource-based view through a stakeholder lens thus might bestow a heightened sense of normativity upon decision-making and strategizing in diverse boards, as norms, ethics and values in terms of societal expectations might be better integrated into the process (FREEMAN/DMYTRIYEV/PHILLIPS 2021).

As directors each hold diverging perspectives and preferences due to their personal characteristics and background, board diversity is empirically linked to differences in firm outcomes, like financial, risk or sustainable performance (AGUILERA et al. 2021; BEJI et al. 2021; ISMAIL et al. 2020; KATMON et al. 2019; KHAN et al. 2024; KHAN/KHAN/BIN SAEED 2019; POST/RAHMAN/MCQUILLEN 2015; POST/RAHMAN/RUBOW 2011; YANG et al. 2019). It is especially by acknowledging the interests of multiple stakeholders, though, that diverse boards might play a fundamental role in achieving better environmental and social outcomes (BEJI et al. 2021) and thereby supporting the firm's long-term success. Hence, board diversity helps explain environmental and social performance better from the resource-based view when the theory adopts a stakeholder perspective (BARNEY 2018; O'NEILL/SAUNDERS/MCCARTHY 1989; PAOLONE et al. 2024).

While one could think that board diversity makes it more difficult to coordinate on one common goal, it might just be an advantage when it comes to coordinating and targeting the diverse aspects of sustainability and satisfying multiple stakeholders (CHEN et al. 2024). First, diverse boards combine distinct specialized skills, experience, qualifications, reputation and competences of their directors, which helps them advising on a broader range of environmental and social matters (ISMAIL/LATIFF 2019; KATMON et al. 2019). Differences in gender, age, ethnic and cultural background bring them to ask different questions, as they have different focuses and concerns (KATMON et al. 2019; JOECKS/PULL/SCHARFENKAMP 2024; 2019). Second, the skill combination of diverse boards generates new ideas (KATMON et al. 2019; JOECKS/PULL/SCHARFENKAMP 2024) to foster the necessary innovation and creativity necessary in sustainable evolvement (HARJOTO/LAKSMANA/LEE 2015; ISMAIL/LATIFF 2019; LI/HE 2023). Third, diverse boards are more aware of the need to stick to ethical norms to reduce potential costs of non-compliance, thus increasing investments in sustainability-related projects (PAOLONE et al. 2024).

Different aspects of diversity affect environmental and social outcomes for specific reasons each. However, directors can differ from one another in multiple attributes, each contributing to board diversity. This study focuses on diversity in terms of a composite measure of visible demographic attributes, i.e. age, gender and nationality diversity (BEAR/RAHMAN/POST 2010; HAFSI/TURGUT 2013; BEJI et al. 2021; DARMADI

2011). Measuring them as a composite term acknowledges that boards can still be diverse, even if they lack variety in one dimension. The three dimensions age, gender and nationality are not only easily measurable, but – despite their observable nature – often also entail cognitive unobservable professional and personal differences between the directors that are arguably the very reason for the emergence of varied perspectives in the board (HAFSI/TURGUT 2013; DARMADI 2011). That is, age diversity reflects a wider array of business experience on a professional level, and generational behaviors on a personal level (e.g. BEJI et al. 2021; HAFSI/TURGUT 2013; MENICUCCI/PAOLUCCI 2022). Gender diversity is often associated with differences in education, and with diverse personal cognitive patterns due to different gender socialization (e.g. BEAR/RAHMAN/POST 2010; BEJI et al. 2021). On the professional level, nationality diversity can represent the variety in international experience and knowledge, and ethnic or cultural differences on a personal level (e.g. DARMADI 2011; BEJI et al. 2021).

Board age diversity introduces a mix of experience and risk-taking behaviors (DARMADI 2011), and thus enriches the human capital available to the organization's strategic planning. Older directors might also contribute long-term industry insights and a cautious approach to sustainability, while younger members might offer new ideas, show a greater willingness to embrace innovative solutions and a higher sensibility to environmental and social matters (HAFSI/TURGUT 2013). The combination of business experience and more conservative behavior by older directors and more open-minded and potentially riskier approach by younger directors could take into account more stakeholders (AGUILERA/JACKSON 2010; HAFSI/TURGUT 2013; DARMADI 2011; MENICUCC/PAOLUCCI 2022). This might enhance the board's ability to analyze and adapt to recent market and industry trends and needs, thereby fostering more comprehensive and balanced strategies in addressing social and environmental responsibilities.

Gender diversity can increase the available perspectives in a board due to the traditional gender roles and socialization, resulting in different personal attributes and leadership foci (BEJI et al. 2021; BROUGH et al. 2016; EAGLY/JOHANNESEN-SCHMIDT/VAN ENGEN 2003). Female directors are often associated with communal traits, attunement to social and environmental concerns and perception of different

matters than male directors (KASSINIS et al. 2016; KHAN/KHAN/BIN SAEED 2019). Furthermore, female directors have on average higher educational degrees and professional experience (BEAR/RAHMAN/POST 2010; HILLMAN/CANNELLA 2002), such that gender diversity on the board introduces a broader range of perspectives, experiences, and approaches to decision-making, which can enhance the board's understanding of market and industry demands related to environmental and social topics.

Nationality diversity could enrich the board with different cultural insights, which might foster an understanding of demands regarding environmental and social topics in an international market (KATMON et al. 2019; KHAN et al. 2024). Responding to the increasingly international business environments entailed by globalization, more nationality diverse boards provide knowledge of various environmental and social regulations, practices, and cultural attitudes towards sustainability, enabling the board to come up with more holistic environmental and social strategies (DARMADI 2011; OXELHEIM/RANDØY 2003; BEJI et al. 2021). With the progression of globalization, more and more (international) stakeholders are associated with firms, such that nationality diverse boards could have a competitive advantage in identifying and addressing more of these stakeholders (OXELHEIM/RANDØY 2003; DARMADI 2011).

As argued above, all these board diversity aspects might offer their own resources to a firm. However, boards mostly not only vary with regard to one of these dimensions but rather bring together directors that differ with regard to possibly all three dimensions. That is, the combination of the latter reflects their uniqueness as an internal resource even better than the individual dimensions. Therefore, and based on the preceding arguments, I derive the first hypotheses as follows:

H1a: There is a positive relation between board diversity and firms' environmental performance.

H1b: There is a positive relation between board diversity and firms' social performance.

3.2.2 The moderating role of board size

According to the resource-based view, firms can achieve long-term sustainable performance goals in a competitive environment by optimally using their internal resources (BARNEY 1991; ISMAIL/LATIFF 2019). I have argued that board diversity is

such a resource and have postulated a positive contribution to environmental and social performance. However, the extent to which board diversity can lead to meaningful outcomes also depends on the board's ability to successfully use the resources that its diversity implies. With the resource-based view, I argue that board size is a crucial enabler of effective usage of board diversity as an internal resource and contributor to environmental and social performance.

First, larger boards might have more developed organizational resources, i.e. their corporate governance and formal structures enable them to more efficiently use the board's diverse variety of perspectives and skills. For instance, larger boards are more likely to have committees for specialized areas of responsibility, such as a CSR committee (ENDRIKAT et al. 2021; ZAHRA/PEARCE 1989). In that way, diverse directors could contribute their unique insights and expertise in a more efficient way, rather than finding consensus in a less formally organized smaller board. While scholars argue that diverse boards might face more coordination problems and inefficiencies due to social categorization (CHEN et al. 2024; PAOLONE et al. 2024), formal structures might help mitigate these issues by streamlining the decision-making process. This can help to leverage the unique resources board diversity offers to further benefit environmental and social performance.

Second, larger boards provide more human capital resources, i.e. they dispose of more directors each contributing specific knowledge and capacities (DALTON et al. 1999; ISMAIL et al. 2020; DE VILLIERS/NAIKER/VAN STADEN 2011; KATMON et al. 2019), amongst others improving their monitoring function (HILLMAN/DALZIEL 2003). Contrarily, smaller boards might be rather restricted in their human capital capacities and capabilities and followingly focus their work on the firm's "mere" financial performance and its direct survival. Conversely, larger boards have the necessary manpower, resources and knowledge to dedicate to issues exceeding the direct financial well-being of the firm and managerial myopia (ENDRIKAT et al. 2021; ZAHRA/PEARCE 1989) and can better advance environmental and social performance, which are ultimately relevant for a firm's longevity. That is, while diverse boards might give environmental and social matters more consideration in the firm strategy, larger boards offer a more favorable setting in terms of personnel capacity and external relations to actually put that strategy into practice (DALTON et al. 1999; DE VILLIERS/NAIKER/VAN

STADEN 2011; PFEFFER 1972). Furthermore, larger boards have greater influence on executive directors and are less susceptible to executive influence or domination (OCASIO 1994; ZAHRA/PEARCE 1989), making them more efficient in asserting their strategy. Following these I hypothesize:

H2a: Board size positively moderates the relationship between board diversity and firms' environmental performance.

H2b: Board size positively moderates the relationship between board diversity and firms' social performance.

3.3 Method and data

3.3.1 Sample

This study uses a dataset compiled of 190 publicly listed firms from 21 European countries, and excludes firms from the more heavily regulated financial sector, which is in line with recent board diversity literature (GUPTA/CRILLY/GRECKHAMER 2020; MATSA/MILLER 2013; YANG et al. 2019). The exclusion of financial firms from the sample ensures that the firms in the sample are not subject to restrictive specific regulatory frameworks that might influence their social and environmental performance, allowing for a more generalizable examination of board diversity as an explanatory factor. The observation period covers the years from 2002 to 2019, resulting in a final dataset consisting of 2,415 firm-year observations. I integrate data from three sources - Asset4 by Thomson/Refinitiv, Datastream by Thomson/Refinitiv and BoardEx - to build a dataset that enables the study of the relationship between board diversity and corporate social and environmental performance.

Data on social and environmental performance was obtained from Asset4, a comprehensive and widely used dataset provided by Thomson/Refinitiv (AL-SHAER/ZAMAN 2019; AOUADI/MARSAT 2018; BENLEMLIH et al. 2018; CHENG/IOANNOU/SERAFEIM 2014; DREMPETIC/KLEIN/ZWERGEL 2020; GUPTA/CRILLY/GRECKHAMER 2020; HAWN/IOANNOU 2016; IOANNOU/SERAFEIM 2012; SURROCA et al. 2020). Asset4 offers detailed metrics on ESG data with consistent and comparable data across companies and countries. Asset4 analysts retrieve the relevant information form publicly available sources offered both by firms and third parties. Amongst others, these include annual reports, CSR reports, firm websites, as well as stock exchanges and news. The key

advantage of the Asset4 data is the detailed information it provides. Made up of more than 500 single measures, it integrates those into broader categories ranging from 0 to 100 each. The Asset4 dataset offers an overall ESG score, but also separate scores for Environmental, Social (and Governance) performance. The latter are again divided into sub-categories identifying different stakeholder groups, which are used in post-hoc analyses of this study. The environmental score consists of the sub-categories 'emissions', 'resource use' and 'innovation', while the social score is derived from the sub-categories 'community', 'human rights', 'workforce' and 'product use'. The scores are generated from within-industry percentile measures and calculated with in-dustry-specific weights for the measures, reflecting their relative importance amongst industries. (REFINITIV 2021)

Firm-level data is retrieved from Datastream, a widely used financial database by Thomson/Refinitiv, and board-level data is obtained from BoardEx (AHERN/DITTMAR 2012; BENNOURI/DE AMICIS/FALCONIERI 2020; CLARK/ARORA/GABALDON 2022; MATEOS DE CABO et al. 2022; YANG et al. 2019). BoardEx is a global database cover-ing firm board composition and director profiles, including demographic information such as tenure, education, age, nationality and gender.

3.3.2 Variables

Dependent variables

The dependent variables used in my main analysis are the Asset4 *environmental* and *social performance* scores. To further explore more nuanced aspects, I will use their three sub-categories *emissions*, *resource use* and *innovation* of the environmental score, and the four sub-categories *community*, *human rights*, *workforce* and *product use* for the social score respectively. *Emissions* reflects the emissions of CO_2 and equivalent greenhouse gases, waste, protection of biodiversity and environmental management systems. *Innovation* captures production innovation as well as spendings on research & development and green revenues. *Resource use* quantifies economical use of water and energy as well as the sustainability of the packaging and supply chain. *Community* reflects the contribution to society and *human rights* the engagement for and respect of human rights. *Workforce* considers workforce inclusivity and diversity, training and career development opportunities, working conditions and employee health and safety. Lastly, *product responsibility* evaluates product quality, data privacy

and responsible marketing. All (sub-)scores range from 0 to 100, with 0 expressing the lowest and 100 the highest possible performance. (REFINITIV 2021)

Explanatory and moderation variable

The main explanatory variable used to test H1 is *board diversity*, and the moderating variable to test H2 is *board size*. Both variables are measured on the board-year-level. *Board diversity* is calculated as the mean of *nationality diversity*, *gender diversity* and *age diversity* (CHEN et al. 2024), which are also individually used in complementary analyses. The separate diversity measures are calculated as Blau's index according to the formula $1 - \sum p_i^2$, with p_i^2 representing the fraction of board members belonging to a specific age group, gender or nationality (CHEN et al. 2024; ISLAM/FRENCH/ALI 2022; ZHANG 2020). For the calculation of *nationality diversity*, each nationality represents an own category (CHEN et al. 2024). *Gender diversity* is generated with the count of male and female directors (CHEN et al. 2024; ZHANG 2020). *Age diversity* is based on the five age categories of <40, 40-49, 50-59, 60-69 and ≥70 years (ISLAM/FRENCH/ALI 2022). For a robustness check, I further use the measure *age spread*, computed as the coefficient of variation, i.e. the standard deviation of the age of the directors, divided by their average age. The moderator *board size* is the absolute number of directors composing a firm's board in the evaluated year.

Control variables

In accordance to YANG/DIEDERICH/RIEPE (2024), I control for board- and firm-level variables that might influence the dependent variables. To check for the board's overall expertise and knowledge about the firm and its operating market, I include *tenure* as the directors' average tenure on a firm's board (AHERN/DITTMAR 2012; TRIANA/MILLER/TRZEBIATOWSKI 2014; YANG/DIEDERICH/RIEPE 2024). *Education* accounts for human capital acquired through formal education and is measured as the average of the directors' number of above-bachelor-level educational degrees (AHERN/DITTMAR 2012; YANG/DIEDERICH/RIEPE 2024). To account for *firm size*, I include the natural logarithm of total assets (BALDINI et al. 2018; CHENG/IOANNOU/SERAFEIM 2014; DREMPETIC/KLEIN/ZWERGEL 2020; MITRA/POST/SAUERWALD 2021; YANG/DIEDERICH/RIEPE 2024). I include *financial performance,* measured as the return on assets (BIN KHIDMAT/AYUB KHAN/ULLAH 2020; KHAN et al. 2024), as a further control variable as it is arguably related to social and environmental performance

(HAFSI/TURGUT 2013; MENICUCCI/PAOLUCCI 2022). While in the sample used in chapter 3, there is a high correlation between firm size (as well as its alternative specifications, e.g. financial slack) and firm performance, which might have led to collinearity issues, this is not the case in my sample (see 3.4.1 Descriptive statistics), thus making its inclusion less problematic and a relevant control.

3.3.3 Empirical strategy

To test my hypotheses, I use a fixed effects regression model. Firm fixed effects absorb constant firm-related factors, such as industry, and time fixed effects capture time-specific circumstances, like exogenous shocks, that might affect environmental and social performance. To obtain more robust standard errors, I cluster the standard errors on the firm level to account for potential intra-firm correlation of the observations. Because the variables' units of measurement are not consistent and to facilitate the interpretation of the coefficients – especially of the interaction effect – all variables are standardized to have a mean of zero and a standard deviation of one.

3.4 Results

3.4.1 Descriptive statistics

Table 3.1 provides summary statistics and correlations of the unstandardized variables. The mean *environmental performance* and *social performance* is 58.25 and 62.5, with variances of 28.77 and 24.21 respectively. *Board diversity* ranges from 0 to 0.67, with an average of 0.43 and a standard deviation of 0.1, while *board size* ranges from 2 to 25, with an average of 11.46 members and a standard deviation of 4.28. This suggests that there is sufficient variation in the sample to yield precise estimates.

The correlations are as expected and show that *board diversity* is positively linked to *environmental* and *social performance*. Surprisingly, *age diversity* is negatively, yet not significantly correlated with the dependent variables, which will be subject to further scrutiny in post-hoc analyses. It is noteworthy that the correlation between *board diversity* and *board size* is small and even negative ($r=–0.06$, $p<0.05$). While one might worry that larger boards are also automatically more diverse, which would make it difficult to disentangle the regression effects, leading to collinearity and less precise coefficient estimations with high standard errors, this is no concern in my data.

Table 3.1: Summary statistics and correlations

	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Environmental performance	58.25	28.77	0	98.44	-									
(2) Social performance	62.5	24.21	1.68	98.63	0.76*	-								
(3) Board diversity	.43	.11	0	.67	0.33*	0.36*	-							
(4) Board age diversity	.61	.1	0	.79	-0.03	-0.03	0.22*	-						
(5) Board gender diversity	.27	.17	0	.5	0.36*	0.37*	0.6*	-0.03	-					
(6) Board nationality diversity	.414	.24	0	.88	0.18*	0.22*	0.79*	-0.1*	0.09*	-				
(7) Board size	11.46	4.28	2	25	0.31*	0.24*	-0.06*	0.22*	0.07*	-0.22*	-			
(8) Tenure	4.79	2.3	0	16.1	0.06*	0.12*	-0.02	0.08*	0.06*	-0.1*	0.08*	-		
(9) Education	1.99	.54	.3	4.4	0.11*	0.12*	0.25*	-0.2*	0.08*	0.35*	-0.24*	-0.1*	-	
(10) Firm size	9.55	1.45	1.27	13.62	0.52*	0.55*	0.22*	-0.03	0.3*	0.08*	0.33*	0.14*	0.13*	-
(11) Firm performance	.055	.07	-.47	.94	-0.05*	-0.01	0.02	-0.04*	0.09*	-0.02	-0.17*	0.11*	0.04*	0.19*

N=2,415, * *p<0.01*

None of the other variables correlate highly either, hence not raising concern for multicollinearity issues. This is corroborated by the estimated variance inflation factor (VIF) of the variables. All VIF are below 2, except for the control variable *firm size* which is 2.00 and 2.51 for social and environmental performance respectively, suggesting no issues with collinearity.

Figures 3.1 to 3.4 display the distribution of (overall) *board diversity*, *board age diversity*, *board gender diversity* and board *nationality diversity* respectively. Figures 3.1 and 3.2 show that *board diversity* approximately follows a normal distribution around its average, while *board age diversity* is slightly left-skewed. *Board gender diversity* in Figure 3.3 and *board nationality diversity* in Figure 3.4 don't follow a normal distribution pattern. It is noticeable, however, that they have rather high fractions of zero diversity, amounting to 19.25% of all observations with no board gender diversity, i.e. boards that are entirely male as there are no all-female boards in the data set, and 10.93% of all observations with only one nationality represented. Comparing this to Figure 3.1, which shows that only 0.0017% of all boards have no board diversity at all[4], it suggests that the lack in gender or nationality diversity in boards is either partially made up for by age diversity, or that board gender and board nationality diversity compensate for each other.

Figure 3.1: Distribution of (overall) board diversity

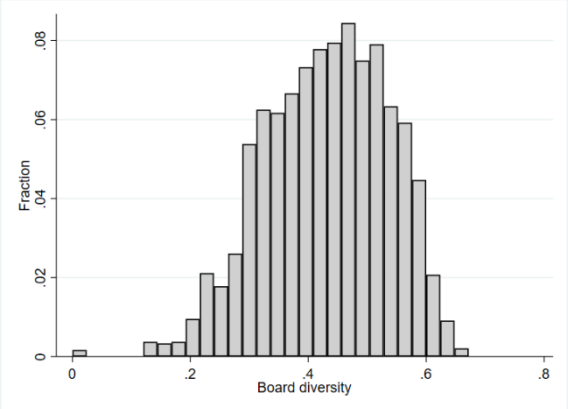
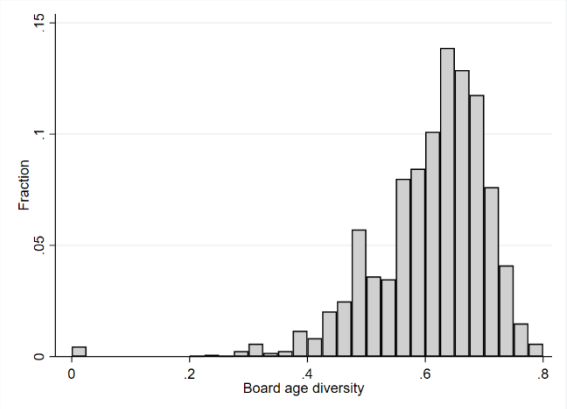


Figure 3.2: Distribution of board age diversity



[4] The four cases with zero diversity represent cases of rather small boards, i.e. with 3 to 5 directors. In these cases, all directors were male and of the same age category and nationality.

Figure 3.3: Distribution of board gender diversity

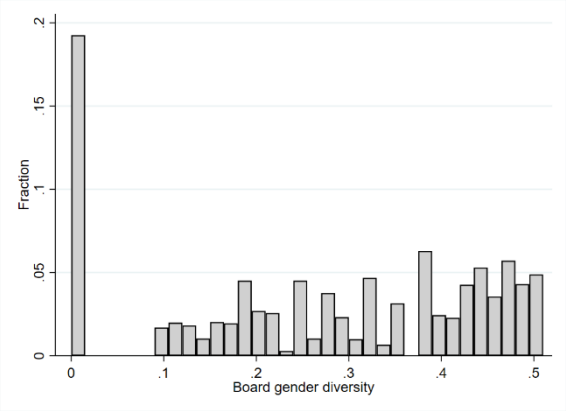
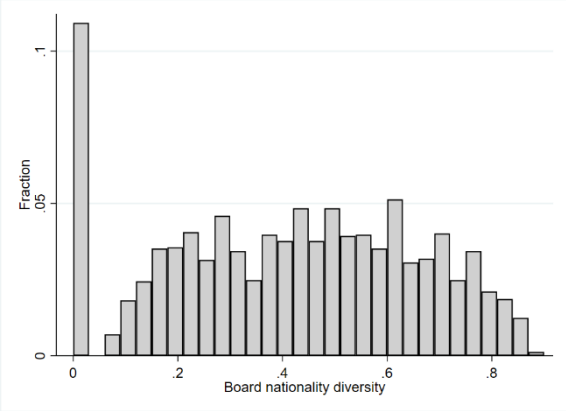


Figure 3.4: Distribution of board nationality diversity



3.4.2 Main results

Table 3.2 reports the regression results of the main analysis. Models 1 and 4 include the control variables and the explanatory variable *board diversity* to test H1a and H1b. In Models 2 and 5, I add *board size* to check for a potential direct effect of board size, and Models 3 and 6 include the interaction of board diversity and board size to assess the moderation effect of board size on the relation between board diversity and environmental and social performance respectively (H2a & H2b).

The highly statistically significant positive coefficients of *board diversity* in Models 1 (β=0.346; $p<0.01$) and 4 (β=0.374; $p<0.01$) suggest that board diversity is positively linked to the environmental and social performance of the observed firms, hence supporting H1a and H1b. The inclusion of *board size* in Models 2 and 5 shows no statistically significant coefficient for the variable *board size*, suggesting that it has no direct explanatory value for the dependent variables. The positive coefficients of the interaction in Models 3 (β=0.081; $p<0.01$) and 6 (β=0.110; $p<0.01$), though, are highly statistically significant. This hints at a moderating effect of board size on the relation between board diversity and environmental and social performance, such that board diversity seems to improve environmental and social performance more if the board is larger. This is supporting evidence for both hypotheses H2a and H2b. Furthermore, the coefficients of *board diversity* remain unchanged in terms of direction, size and significance, which corroborates my findings for H1a and H2b.

Table 3.2: Main results

Dependent variable=	(1) Env. perf.	(2) Env. perf.	(3) Env. perf.	(4) Soc. perf.	(5) Soc. perf.	(6) Soc. perf.
Explanatory variables						
Board diversity	0.346***	0.346***	0.292***	0.374***	0.375***	0.301***
	(0.038)	(0.038)	(0.045)	(0.042)	(0.041)	(0.040)
Board size		0.018	0.051		-0.083	-0.037
		(0.077)	(0.076)		(0.080)	(0.083)
Board diversity * Board size			0.081***			0.110***
			(0.028)			(0.026)
Control variables						
Tenure	0.088*	0.088*	0.091*	0.129***	0.129***	0.133***
	(0.049)	(0.049)	(0.049)	(0.046)	(0.046)	(0.046)
Education	0.098*	0.099*	0.092	0.103	0.101	0.091
	(0.058)	(0.058)	(0.059)	(0.065)	(0.064)	(0.065)
Firm size	0.373***	0.369***	0.377***	0.479***	0.495***	0.505***
	(0.090)	(0.090)	(0.089)	(0.100)	(0.099)	(0.098)
Firm performance	-0.042	-0.041	-0.045	-0.011	-0.012	-0.017
	(0.034)	(0.034)	(0.034)	(0.039)	(0.038)	(0.039)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.010	-0.019	-0.041	-0.123	-0.081	-0.111
	(0.083)	(0.096)	(0.095)	(0.091)	(0.103)	(0.105)
Observations	2,415	2,415	2,415	2,415	2,415	2,415
R-squared	0.233	0.233	0.242	0.278	0.279	0.295
Number of firms	190	190	190	190	190	190

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

3.4.3 Additional analyses

Building on the supporting evidence for my hypotheses, and to contribute new aspects of environmental and social performance to the current literature, I will conduct post-hoc additional analyses to explore the implications of board diversity and board size on environmental and social performance in more detail. In the following sections, I will thus look at more nuanced aspects, i.e. the constituents of environmental and social performance. Next, I will explore whether the individual components of board diversity might relate to those sub-categories in different ways. Furthermore, I will re-run the main regressions with lagged explanatory variables as a robustness check to investigate potential delayed repercussions of board diversity and board size. Finally, I will explore a different computation of age diversity as a robustness check, based on surprising prior findings.

Environmental and social performance sub-categories

In what follows, I explore the sub-categories of environmental and social performance to see whether they are affected differently by board diversity and board size. For environmental performance, the Asset4 data distinguishes between emissions, *resource use* and *innovation*, and for social performance it includes *community*, *human rights*, *workforce* and *product use*, as described in chapter 3.3.2 on the variables.

Table 3.3: Sub-categories of environmental performance

Dependent variable=	(3) Env. perf.	(7) Emissions	(8) Resource use	(9) Innovation
Explanatory variables				
Board diversity	0.292***	0.228***	0.224***	0.302***
	(0.045)	(0.042)	(0.041)	(0.048)
Board size	0.051	0.104	0.039	0.022
	(0.076)	(0.076)	(0.074)	(0.093)
Board diversity * Board size	0.081***	0.048*	0.065**	0.113***
	(0.028)	(0.028)	(0.027)	(0.032)
Control variables	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Constant	-0.041	-0.060	-0.016	0.098
	(0.095)	(0.078)	(0.090)	(0.095)
Observations	2,415	2,415	2,415	2,415
R-squared	0.242	0.191	0.183	0.161
Number of firms	190	190	190	190

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.3 presents the outcomes of the regressions conducted on the environmental sub-categories and includes the main regression on environmental performance (Model 3) once again for comparison. It reproduces highly similar results to the main analysis in terms of direction and coefficient sizes of the explanatory variables, with only little nuance between the models. This is rather surprising, as I would have expected more variation in the outcomes in terms of coefficient sizes, as some environmental goals are presumably easier to target. For instance, investments in research and development (*innovation*) could be implemented faster than reducing production emissions (*emissions*).

It is noticeable, however, that the regression on *innovation* in Model 9 has a larger direct effect of board diversity as well as a higher, more statistically significant moderation effect than Model 7 on *emissions* and Model 8 on *resource use*, also exceeding the overall effects of the main analysis on environmental performance (Model 3). This might be understood as supporting evidence to prior literature that firms with higher board diversity are indeed more innovative (e.g. LI/HE 2023), and that this is enhanced by board size. While all the models are significant, one might conclude that the overall effects on environmental performance are driven slightly more by higher innovative capabilities than emission reduction and sustainable use of resources.

Table 3.4: Sub-categories of social performance

Dependent variable=	(6) Soc. perf.	(10) Commu-nity	(11) Human rights	(12) Work-force	(13) Product use
Explanatory variables					
Board diversity	0.301***	0.216***	0.299***	0.092***	0.280***
	(0.040)	(0.039)	(0.045)	(0.032)	(0.051)
Board size	-0.037	0.081	-0.063	-0.017	-0.045
	(0.083)	(0.067)	(0.086)	(0.052)	(0.089)
Board diversity * Board size	0.110***	0.058**	0.109***	0.054**	0.113***
	(0.026)	(0.028)	(0.030)	(0.022)	(0.026)
Control variables	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Constant	-0.111	0.064	-0.154	0.055	-0.276**
	(0.105)	(0.088)	(0.106)	(0.067)	(0.114)
Observations	2,415	2,415	2,415	2,415	2,415
R-squared	0.295	0.134	0.230	0.105	0.201
Number of firms	190	190	190	190	190

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<01.

Table 3.4 presents the regression results on the social sub-categories and includes the main regression result (Model 6) for reference. It follows a similar pattern as Table 3.3, with hardly any difference between the models regarding *community* (Model 10), *human rights* (Model 11), *workforce* (Model 12) and *product use* (Model 13), or overall social performance (Model 6). The moderating effects of *board size* are roughly twice as large in Models 11 and 13 compared to Models 10 and 12, but only the results on *workforce* in Model 12 stand out overall. *Board diversity* has a comparatively small relation to *workforce* in terms of coefficient size, also only being slightly pushed by

board size. While employees as a stakeholder group hence seem to play a slightly less prominent role in the boards' efforts towards improving social performance, all sub-categories contribute to enhanced social performance, but none particularly sticks out.

Board age, board gender and board nationality diversity

So far there is only little heterogeneity between the sub-categories above, but the analysis can be broken down further to investigate other potential drivers. My main explanatory variable *board diversity* is made up of the three components *board age*, *board gender* and *board nationality diversity*, and possibly the individual diversities might help explain nuances in the sub-categorical environmental and social results. Some prior research suggests, for instance, that workforce and human right matters as particularly forwarded by gender-diverse boards (MONTEIRO/GARCÍA-SÁNCHEZ/AIBAR-GUZMÁN 2022). To shed additional light on the other sub-categories, I regressed the diversities separately on the environmental performance and its sub-categories in Table 3.5, as well as the social performance and its sub-categories in Table 3.6.

Table 3.5 displays a striking difference between the board diversity measures. *Board age diversity* has no significant direct relation to *emissions* (Model 15) and *resource use* (Model 16) and is even negatively related to overall environmental performance (Model 14; β=–0.049; $p<0.1$) and *innovation* (Model 17; β=–0.082; $p<0.01$), which is also not absorbed by the moderating effect of board size. This is unexpected in so far that, from a theoretical perspective, age diversity predicts improved firm performance (BAE/HAN 2019; KHAN et al. 2024). These predictions are also mostly empirically corroborated (ISMAIL/LATIFF 2019), while only few studies find a negative relation between age diversity and performance (e.g. KATMOn et al. 2019; KHAN et al. 2024). This could arguably be due to the elder's lack of appreciation of their younger colleagues' input and decisions (KATMON et al. 2019; KHAN et al. 2024), thereby lowering the board's strategic effectiveness toward environmental improvement (TALAVERA/YIN/ZHANG 2018). Simultaneously, board size is void in the relationship between age diversity and environmental performance.

Regarding the role of *board gender* and *board nationality diversity*, Table 3.5 shows no noteworthy differences in the sub-categories compared to the main category *environmental performance* can be found. Following the theoretical predictions and prior empirical findings, *board gender* and *board nationality diversity* are significantly

positively linked to all environmental performance categories. *Board size*, however, seems to play a bigger role in reinforcing the positive effect of *board gender diversity* than *board nationality diversity*. A potential reason for this might be that female directors are often associated with communication skills, collaboration and consensual decision-making (ASHFORTH/MAEL 1989; BROUGH et al. 2016). That is, gender diverse boards, that arguably have better internal communication and coordination skills, might benefit more from a large board size as they can exploit the upsides in a more efficient way. At the same time, while more international boards are prone to targeting diverse stakeholders and improving various environmental outcomes, it is argued that they also face communication challenges due to cultural differences and possible language barriers (KATMON et al. 2019; MILETKOV/POULSEN/WINTOKI 2017). That is, the larger the board, the more dominant those issues might become and dampen the positive moderating effect of the board's manpower.

Table 3.5: Board age, board gender and board nationality diversity and environmental performances

Dependent variable=	(14) Env. perf.	(15) Emissions	(16) Resource use	(17) Innova-tion	(18) Env. perf.	(19) Emis-sions	(20) Resource use	(21) Innova-tion	(22) Env. perf.	(23) Emis-sions	(24) Resource use	(25) Innova-tion
Explanatory variables												
Board size	0.043	0.095	0.034	0.009	0.054	0.102	0.041	0.029	0.060	0.114	0.047	0.023
	(0.090)	(0.081)	(0.077)	(0.114)	(0.070)	(0.071)	(0.065)	(0.094)	(0.086)	(0.082)	(0.080)	(0.102)
Age diversity	-0.049*	-0.022	-0.033	-0.082***								
	(0.028)	(0.024)	(0.028)	(0.031)								
Age diversity *	-0.024	0.003	-0.028	-0.032								
Board size	(0.025)	(0.024)	(0.022)	(0.032)								
Gender diversity					0.292***	0.226***	0.227***	0.305***				
					(0.033)	(0.033)	(0.034)	(0.042)				
Gender diversity *					0.060***	0.026	0.049**	0.095***				
Board size					(0.022)	(0.022)	(0.021)	(0.028)				
Nationality diversity									0.236***	0.169**	0.170**	0.281***
									(0.076)	(0.066)	(0.066)	(0.081)
Nationality diversity *									0.080*	0.053	0.070*	0.090*
Board size									(0.043)	(0.039)	(0.042)	(0.051)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.219**	-0.228***	-0.180**	-0.129	0.032	-0.032	0.012	0.132	-0.129	-0.161*	-0.113	-0.024
	(0.091)	(0.084)	(0.091)	(0.100)	(0.083)	(0.077)	(0.086)	(0.098)	(0.092)	(0.084)	(0.091)	(0.100)
Observations	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415
R-squared	0.135	0.119	0.115	0.064	0.265	0.202	0.198	0.185	0.178	0.147	0.142	0.105
Number of firms	190	190	190	190	190	190	190	190	190	190	190	190

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.6: Board age, board gender and board nationality diversity and social performances

Dependent variable=	(26) Soc. Perf.	(27) Commu-nity	(28) Human rights	(29) Work-force	(30) Product use	(31) Soc. Perf.	(32) Com-munity	(33) Human rights	(34) Work-force	(35) Product use	(36) Soc. Perf.	(37) Com-munity	(38) Human rights	(39) Work-force	(40) Product use
Explanatory variables															
Board size	-0.039	0.082	-0.071	-0.018	-0.043	-0.029	0.084	-0.053	-0.020	-0.040	-0.027	0.092	-0.058	-0.008	-0.035
	(0.089)	(0.072)	(0.093)	(0.053)	(0.098)	(0.071)	(0.061)	(0.074)	(0.051)	(0.085)	(0.093)	(0.074)	(0.096)	(0.054)	(0.096)
Age diversity	-0.042	-0.013	-0.039	-0.014	-0.071**										
	(0.027)	(0.021)	(0.034)	(0.020)	(0.031)										
Age diversity *	-0.093***	-0.055***	-0.068***	-0.056***	-0.093***										
Board size	(0.021)	(0.020)	(0.025)	(0.017)	(0.027)										
Gender diversity						0.323***	0.224***	0.324***	0.102***	0.309***					
						(0.031)	(0.035)	(0.035)	(0.028)	(0.040)					
Gender diversity *						0.096***	0.047*	0.099***	0.035*	0.093***					
Board size						(0.021)	(0.026)	(0.023)	(0.020)	(0.026)					
Nationality diversity											0.184**	0.127**	0.176**	0.049	0.197**
											(0.071)	(0.060)	(0.074)	(0.057)	(0.083)
Nationality diversity *											0.133***	0.080**	0.113**	0.088***	0.133***
Board size											(0.040)	(0.035)	(0.048)	(0.032)	(0.038)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.352***	-0.106	-0.395***	-0.020	-0.500***	-0.062	0.095	-0.102	0.068	-0.224**	-0.261**	-0.045	-0.310***	0.016	-0.405***
	(0.105)	(0.091)	(0.106)	(0.068)	(0.109)	(0.093)	(0.082)	(0.097)	(0.062)	(0.105)	(0.113)	(0.094)	(0.113)	(0.073)	(0.117)
Observations	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415	2,415
R-squared	0.184	0.071	0.135	0.085	0.132	0.342	0.155	0.273	0.108	0.233	0.219	0.091	0.161	0.097	0.155
Number of firms	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.6 displays similar findings to Table 3.5 for the different board diversities and their ramifications on social performance and its sub-categories. Once again, *board age diversity* is not related to social outcomes, and even negatively related to *product use* (Model 30; β=–0.071; $p<0.05$). Conversely, *board size* here seems to negatively moderate the relation between *board age diversity* and social outcomes, i.e. larger boards create or aggravate the negative implications of *board age diversity*. One could think of potential polarization effects in larger boards as a potential reason for this finding. As previously explained, elder generations might lack appreciation for the younger generations' contributions (KATMON et al. 2019; KHAN et al. 2024). Whereas this in itself is apparently not or only limitedly harmful to social outcomes, larger boards with more members per generation might be more prone to building sub-groups than smaller boards, thereby worsening the potential issue and negatively affecting social outcomes.

The findings for *board gender* and *board nationality diversity* are highly similar to the main findings, i.e. they also separately positively relate to all the social sub-categories. Likewise, the positive repercussions are enhanced by larger boards, hinting toward the potential leveraging effect of the boards' manpower capacities. The moderating effect of *board size* on *board nationality diversity*, albeit positive for the environmental and social sub-categories, plays are more pronounced role for the social sub-categories as shown in Table 3.6. The findings for *board gender diversity* are also similar to the findings on the environmental sub-categories in Table 3.5. One could, hence, argue again that the favorable setting of large boards can be better exploited by gender-diverse boards' communication and collaboration skills (ASHFORTH/MAEL 1989; BROUGH et al. 2016).

Alternative specification of board age diversity

To check whether the rather surprising findings of *board age diversity* could be due to the specification of the variable as Blau's index based on arbitrarily built age categories, I re-run the regressions of *environmental* and *social performance* on *age spread*. Since the variable is calculated from mean and standard deviations, this should mitigate a potential bias or error based on discretionary categorization of the main specification *board age diversity*. The results reported in Table 3.7, though, corrobo-

rate previous findings. *Age spread* is again negatively related to *environmental performance* (Model 41; β=–0.116; p<0.05) as in Table 3.5, and unrelated to *social performance* (Model 42; β=–0.065; n.s.) as in Table 3.6. Furthermore, *board size* remains insignificant as moderator in the *environmental performance* regression (Model 41; β=0.011; n.s.) and negatively moderates the direct effect in the *social performance* regression (Model 42; β=–0.082; p<0.01). I am hence confident that the findings for age diversity are not driven by a specification issue.

Table 3.7: Age spread and environmental and social performance

	(41)	(42)
Dependent variable=	Envir. perf.	Soc. perf.
Explanatory variables		
Age spread	-0.116**	-0.065
	(0.045)	(0.041)
Board size	0.039	-0.052
	(0.091)	(0.092)
Age spread * Board size	0.011	-0.082***
	(0.032)	(0.030)
Control variables	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Constant	-0.260***	-0.355***
	(0.099)	(0.104)
Observations	2,415	2,415
R-squared	0.141	0.184
Number of firms	190	190

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Time-lagged explanatory variables

To lend more credibility to the main findings, I run a robustness check with the one-year-lags of the two explanatory variables *board diversity* and *board size*, which helps addressing several issues. First, the repercussions of a board's decisions and directives, and thereby the implications of board diversity and board size, might only become visible with a delay. Second, it helps establish the chronological precedence of the explanatory variables, i.e. it better reflects whether board diversity and large boards were in place prior to the evaluated environmental and social performance. Third, using a time lag reduces the possibility of a simultaneity bias caused by the

dependent and independent variables influencing each other at the same time. (GUPTA 2005; STIEBALE 2011)

Table 3.8 shows the regression results of the robustness check. The sample size is reduced to 2,199 and the number of firms decreases by 5, because all observations from the first observation period of the full sample have no preceding values and because all firms that are not observed in two consecutive years also drop out. Models 43-48 are unaffected by the new specification of the explanatory variables in terms of economic and statistical significance. That is, Table 3.8 backs up my conclusions on H1a/b and H2a/b that board diversity is positively linked to environmental and social performance and that this link is reinforced in the presence of larger boards.

Table 3.8: Lagged explanatory variables

	(43)	(44)	(45)	(46)	(47)	(48)
Dependent variable=	Env. perf.	Env. perf.	Env. perf.	Soc. perf.	Soc. perf.	Soc. perf.
Explanatory variables						
Board diversity $_{t-1}$	0.315***	0.315***	0.271***	0.370***	0.371***	0.311***
	(0.034)	(0.034)	(0.042)	(0.039)	(0.039)	(0.039)
Board size $_{t-1}$		0.017	0.047		-0.083	-0.043
		(0.071)	(0.069)		(0.075)	(0.077)
Board diversity $_{t-1}$ * Board size $_{t-1}$			0.064**			0.087***
			(0.026)			(0.028)
Control variables						
Tenure	0.073	0.072	0.076	0.117**	0.121***	0.126***
	(0.047)	(0.047)	(0.047)	(0.046)	(0.046)	(0.046)
Education	0.065	0.066	0.061	0.070	0.067	0.060
	(0.055)	(0.055)	(0.056)	(0.064)	(0.063)	(0.063)
Firm size	0.334***	0.331***	0.339***	0.460***	0.475***	0.485***
	(0.089)	(0.089)	(0.087)	(0.098)	(0.096)	(0.095)
Firm performance	-0.088**	-0.087**	-0.091***	-0.074**	-0.075**	-0.080**
	(0.034)	(0.034)	(0.033)	(0.035)	(0.035)	(0.035)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.118	0.109	0.087	-0.024	0.020	-0.010
	(0.088)	(0.099)	(0.098)	(0.096)	(0.106)	(0.108)
Observations	2,199	2,199	2,199	2,199	2,199	2,199
R-squared	0.206	0.206	0.213	0.271	0.273	0.283
Number of firms	185	185	185	185	185	185

Standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

3.5 Discussion

3.5.1 Key findings and contributions

Based on 2,415 firm-year observations from 2002 to 2019 of 190 listed firms located in Europe, this paper has two main empirical findings. First, firms with higher board diversity have higher overall environmental and social performance, which aligns with previous literature across different international settings (BEJI et al. 2021; CHEN et al. 2024; HAFSI/TURGUT 2013; HARJOTO/LAKSMANA/LEE 2015; ISLAM/FRENCH/ALi 2022), and board size positively moderates this relation, such that firms with highly diverse boards perform even better environmentally and socially when board size increases. Also looking at different aspects of age diversity, my findings predominantly align with the literature. I find a positive association between board gender diversity and environmental and social outcomes (BEJI et al. 2021; KASSINIS et al. 2016; KHAN/KHAN/BIN SAEED 2019; MANITA et al. 2018; TINGBANI et al. 2020) as well as board nationality diversity and environmental and social performance (BEJI et al. 2021). The findings on board age diversity are mixed in previous studies, some indicating, like my study, a negative (HAFSI/TURGUT 2013; KATMON et al. 2019; BIN KHIDMAT/AYUB KHAN/ULLAH 2020; KATMON et al. 2019) or no relation between age diversity and social and environmental performance (MENICUCCI/PAOLUCCI 2022), and others a positive link (ISMAIL/LATIFF 2019).

Particularly the moderating role of board size, however, is insightful as research has so far – to the best of my knowledge – only focused on the direct effect of board size on environmental and social performance. Literature predominantly focuses on two opposing arguments and findings: On the one hand, it is argued that large boards are better monitors, have better control over executives and hence have a higher impact on corporate outcomes (BIN KHIDMAT/AYUB KHAN/ULLAH 2020; PEARCE/ZAHRA 1991; ZAHRA/PEARCE 1989) such as environmental and social performance (HILLMAN/KEIM/LUCE 2001). On the other hand, scholars argue that smaller boards are more performant because they are more efficient and have fewer frictions (YERMACK 1996). By looking at board size as a moderator, I consider it as a contextual variable with an enhancing effect on the positive – or negative, in the case of board age diversity – main link between board diversity and the performance measures. This means that firms can profit from diverse boards in terms of environmental and social performance even

more if those boards are larger. My main findings support that notion, as there is no direct relation between board size and environmental and social performance, but a positive moderation.

This understanding is further corroborated by the results for the individual diversity aspects, which show an augmenting positive effect of board size in case of the favorable board gender and board nationality diversity. Age-diverse boards seem unfavorable in the pursuit of environmental and social performance, and board size again takes the role of an amplifier, i.e. it enhances the negative repercussion. Board size has a (significant) negative moderating effect on environmental social performance, as board age diversity is already detrimental to the outcomes. Hence, board size might be beneficial in case of positive conditions and damaging in case of negative conditions.

Second, I looked at more nuanced aspects of environmental and social performance in terms of their sub-categories, i.e. the reduction of emissions, sustainable use of resources, environmental innovation, contribution to society, adherence to and protection of human rights, the diversity, safety and development of employees and lastly responsible customer treatment. Even though there are no noteworthy differences in terms of statistical significance or direction, I observe that the economic size of the estimates both for the direct and moderating effects are rather important. For instance, higher board diversity is related to human rights roughly thrice as much as to workforce, while the moderating effect of board size is twice as high. These differences underline the relevance to look at more nuanced aspects of environmental and social matters, as well as to consider a variety of stakeholders targeted by or benefiting from those efforts. This sets this paper apart from most of the previous literature, which predominantly looks at the overall performance (BEJI et al. 2021; HAFSI/TURGUT 2013; HARJOTO/LAKSMANA/LEE 2015; ISLAM/FRENCH/ALI 2022) or the CSR disclosure (KATMON et al. 2019; KHAN/KHAN/BIN SAEED 2019; MANITA et al. 2018; MONTEIRO/CEPÊDA/DA SILVA 2024), while only innovation and R&D seem to be a more frequently analyzed outcome (BAE/HAN 2019; CHEN et al. 2024). In additional regressions, I showed that the granularity of analysis becomes even more evident when I consider different aspects of diversity. Mainly, I found the robust negative or inexistent relation between age diversity and environmental and social outcomes on all sub-cat-

egories. This goes against my theoretical predictions and some previous empirical research, with but a few exceptions. Based on S&P500 firms and operationalizing age diversity with the coefficient of variation, HAFSI/TURGUT (2013) find a negative relation between board age diversity and corporate social performance. KATMON et al. (2019), using Blau's index as their main measure, find that age diversity negatively affects CSR disclosure in Malaysian firms. Since the former study used the KLD dataset to measure their dependent variable, and the latter relied on data from Bursa Malaysia, I suppose that my own surprising findings are likely not rooted in an issue related to the Asset4 data.

Furthermore, I followed recent calls by scholars (BARNEY/KETCHEN/WRIGHT 2021; BEAMISH/CHAKRAVARTY 2021) and integrated aspects of stakeholder theory into the resource-based view to explain how board diversity – from a resource-perspective – can be a valuable resource to a firm by accounting for the relevance of stakeholder perception and representation through diverse board member. This also entails the shift from a purely shareholder- and profit-oriented theoretical focus – as is primarily the case in the resource-based view – to a more holistic corporate outcome including environmental and social performance (BARNEY 2018), as is the case in stakeholder theory. Thereby, I adapt the scope of the resource-based view to the more recent subject of corporate sustainability, acknowledging that stakeholders can be used as a firm resource but are also – as beneficiaries of corporate outcomes – fundamental in setting new outcome directives.

3.5.2 Limitations and future research

The approach to this study and the findings come along with limitations that point towards potential future research routes. First, the empirical approach has two major limitations. For one, I included fixed effects to absorb potentially constant unobserved factors, as well as lagged explanatory variables in a robustness check to reduce potential simultaneity bias to improve inference quality. However, even though the latter is frequently used as a remedy to simultaneity, some scholars argue that it might not be an appropriate solution to the issue (BELLEMARE/MASAKI/PEPINSKY 2017; REED 2015). Either way, the present study only makes correlational inferences and does not establish a causal link between any of the variables. Similar to the analysis of board

gender diversity by YANG/DIEDERICH/RIEPE (2024), future research could try to address this issue by exploiting legislative changes or appropriate instrument variables for board diversity aspects to allow causal interpretation. For another, the data sample is limited to European listed firms in non-financial industries and firms with fully available information on directors with respect to gender, age and nationality. I cannot exclude that this might lead to a biased sample selection, and thus both issues restrict the generalizability of the findings.

Second, the findings on age diversity – despite a robustness check – remain puzzling as other research finds a positive relation between age diversity and firm environmental and social outcomes, while only limited research aligns with the present results (BIN KHIDMAT/AYUB KHAN/ULLAH 2020; HAFSI/TURGUT 2013; KATMON et al. 2019; MENICUCCI/PAOLUCCI 2022). Future research might therefore investigate potential (moderating) reasons for these contradicting results.

Third, I cannot rule out that the main findings are in part due to my construct of board diversity based on age, gender and nationality. There are numerous other ways in which diversity can be measured, e.g. with respect to ethnicity, tenure, education, board experience and industry experience (e.g. BEJI et al. 2021; CHENG/IOANNOU/SERAFEIM 2014; HAFSI/TURGUT 2013; LI/HE 2023). Some of these aspects are not accounted for in my study. Though nationality and ethnicity might be closely related, I potentially lose variation in my board diversity measure because I focus on demographic attributes, as explained in chapter 3.2.1. That is, I merely include tenure and education as control variables instead of computing them as further aspects in which boards can be diverse.

Fourth, my results might suffer from omitted variables or absorbed factors. My findings on the sub-categories of environmental and social performance show surprisingly little variation between the outcomes, apart from the coefficient sizes. The firms' operating industries, for instance, might be a key factor in understanding and differentiating which environmental and social issues are more heavily addressed, or rather neglected. Future research should therefore, for one, explore other potentially moderating factors of the relation between board diversity and sustainability outcomes. To that aim, it could prove useful to stick to the more detailed measures of environmental

and social performance, i.e. to see how board diversity affects resource use or emissions in the mining versus the telecommunications industry. For another, this study establishes a link between the variables but falls short of an explanation of which diversity aspect might be beneficial for which environmental or social outcome. The resource-based view and stakeholder theory are restricted in their predictions in so far that they only foretell a positive relation between board diversity and environmental and social performance as broader concepts. They don't offer arguments beyond the vast concepts of these performance measures. While the theories only make general predictions about diversity being useful to cover various levels of expertise and stakeholder interests, future studies could therefore dig deeper into *how* and *why*, for instance, nationality diverse boards might be more inclined towards certain outcomes. In particular, qualitative research, though hard to conduct on board level, could try to uncover in lower-level nationality diverse teams how their constellation affects their disposition towards different environmental and social sub-topics.

While acknowledging its limitations, this study highlights the role of board diversity in shaping environmental and social outcomes and offers a foundation that future research can build on. Particularly the differences in economic significance of the findings regarding the sub-categories suggest that more targeted analyses might clarify in how far – and which aspects of – board diversity can be strategically important to achieve better outcomes. This underscores the relevance of deeper exploration of the interplay between (aspects of) board diversity, contextual factors and organizational outcomes. With further refinement and a more profound understanding of the mechanisms at play, the resulting insights could pave the way for more tailored strategies to enhance environmental and social outcomes.

4. Gender stereotyping and the gender pay gap: A Catch 22 at executive level[5]

Chapter 3 has concluded the first block of this doctoral thesis, which revolved around the implications of diversity amongst *non-executives* for firm *environmental* and *social* performance. Chapter 4 now opens the second thematic block, shifting the focus to visible external differences between *executives* and inequitable executive pay resulting from detrimental dynamics in the executive pay-setting process as a malfunctioning of *governance* practices. We look at differences in executive pay that are unaccounted for by differences in human capital, firm or performance factors. Precisely, chapter 4 tackles the gender pay gap, and chapter 5 examines pay outcomes based on visible perceived dominance.

4.1 Introduction

According to a Financial Times report for 2020, female top executives in the UK's 100 largest companies were paid about 40 per cent less than their male counterparts (MOONEY 2021). The persistent and sizable gender pay gap at the top executive level, in the UK and elsewhere, is a puzzle. Large firms are under considerable pressure to appoint women to top executive positions and boards, and many proactively follow a strategy of gender diversity (HAVRYLYSHYN/SCHEPKER/NYBERG 2023; LESLIE/MANCHESTER/DAHM 2017). This should improve women's bargaining position and increase their pay. Furthermore, the public is acutely aware of questions of pay (in-)equality, and because top executive pay is highly visible, open forms of unfair treatment of women are unlikely. But though the gender pay gap at the top executive level appears to have diminished over time (SCHNEIDER/ISEKE/PULL 2021), recent studies still find female top executives to earn less – even after adjusting for the impact of experience, education, age, pathway into the top executive position, and other fac-

[5] Starting with section 4.1, chapter 4 is joint work with ANJA ISEKE (Ostwestfalen-Lippe University of Applied Sciences and Arts), KERSTIN PULL (University of Tübingen) and MARTIN SCHNEIDER (University of Paderborn) and is published as "Role (in-)congruity and the Catch 22 for female executives: how stereotyping contributes to the gender pay gap at top executive level" in The International Journal of Human Resource Management 35(2024)7: 1283-1311.

tors (HANDSCHUMACHER-KNORS 2023; KULICH et al. 2011; MOHAN 2014; REBÉRIOUX/ROUDAUT 2019; SCHNEIDER/ISEKE/PULL 2021; YANADORI/GOULD/KULIK 2018).

Explanations of the persistent gender pay gap at the top executive level are either market-based or power-and-discrimination-based (SCHNEIDER/ISEKE/PULL 2021). Market-based explanations argue that the pay gap reflects differences between men and women in terms of human capital (MURPHY/ZÁBOJNÍK 2004) and that these differences stem from women's career decisions and comparatively fewer women being in the corporate "pipeline to the top" (HELFAT/HARRIS/WOLFSON 2006). Power-and-discrimination-based approaches argue that such differences reflect unfair disadvantages for women, and that pay determination is gender-biased. An important ingredient of this latter approach are gender stereotypes – the fact that society believes that women and men possess largely different work-related attributes and ought to perform gender-congruent roles.

However, it has not been examined directly how gender stereotyping affects the gender pay gap at top executive level. This is surprising because the literature on the societal evaluation of work demonstrates the prevalence of gender stereotyping: Some occupations and types of work are considered typically feminine, they are mostly conducted by women, are often of lower status, and paid worse (ENGLAND 1999; LEVANON/ENGLAND/ALLISON 2009). Similar arguments for the top executive level are largely absent, with only few exceptions. WANG et al. (2019) show on Chinese data that, when stereotypically masculine traits are valued in a certain industry, male CEOs are paid better than female CEOs. MARKÓCZY/SUN/ZHU (2021) find that the status of top executives in Chinese companies differs by gender. REICHEL/SCHEIBMAYR/BRANDL (2020) argue that HRM is a stereotypically feminine function and, based on an analysis of firms in Austria, France, Germany, Spain, and Sweden, they show that women hold the HRM function more often than other functions. Finally, CHEN/TORSIN/TSANG (2022) study CEO pay in 27 countries and find that the gender pay gap for the CEO position is larger, the lower the society scores on various indicators of gender equality.

Building on such work, we examine a possible gender stereotyping and devaluation of female work to shed light on the gender pay gap among firms' top executives.

ANN CAIRNS, global chair of the 30% Club, which encourages firms in the UK to appoint more women to top executive positions, reacted to the Financial Times report cited above by saying: "If a man and a woman are doing the same role, it is hard to understand why they would be compensated differently" (MOONEY 2021). Our paper explores why. It is common knowledge that different roles or functions at the top executive level, such as human resources or IT, are paid differently (CARPENTER/WADE 2002; DEZSŐ/LI/ROSS 2022). Some functions such as IT are more often held by men, others such as human resources, by women. Starting from these stylized facts, we address two related questions: Are executive functions gender stereotyped? And are gender stereotypes at the executive level related to top executive pay in such a way that they can help explain the gender pay gap?

As its main contribution, our paper demonstrates how stereotypes relating to different executive functions are related to differences in pay between those functions and to the gender pay gap at the top executive level. Previous work such as DEZSŐ/LI/ROSS (2022) found that there are substantial differences in pay between executive functions, and CARPENTER/WADE (2002) argue that such differences are related to the strategic importance of an executive function. Our paper argues that executive functions are stereotyped as being more or less masculine, with implications for status, pay, and the gender pay gap. Hence, we identify an important mechanism linking executive functions to the gender pay gap.

In addition, our study contributes to the literature on the societal evaluation of work. Occupations considered feminine tend to be of lower status than masculine work (ENGLAND 1999; LEVANON/ENGLAND/ALLISON 2009; TAM 1997), and women are paid less than men in masculine jobs (HEILMAN/OKIMOTO 2007). Finding that such effects also apply to executive functions would invigorate the idea that work is gender stereotyped.

In the next section, we provide a theoretical framework organized around role congruity theory and derive a number of hypotheses. Section 3 introduces the data, an unbalanced panel covering individual pay for 353 top executives in large European companies across the years 2014 to 2018. Section 4 presents our findings. Most importantly, we find executive functions to be strongly gender stereotyped: Respondents

from the general public hold surprisingly consistent beliefs about a varying "masculinity" of different executive functions. Masculinity in turn, is related to pay and to the gender pay gap. More specifically, women receive a pay premium in feminine functions – but these functions are paid less in general. They are penalized in masculine functions, which are better paid in general. Hence, we find strong support for the importance of role congruity and gender stereotyping in accounting for persistent differences in pay between male and female top executives. Section 5 discusses the implications of our results and identifies routes for future research.

4.2 Theoretical framework

Prior literature suggests that female executives earn less because women fit less well to executive tasks (e.g. EAGLY/KARAU 2002). We refine our understanding of the executive gender pay gap by considering not only executives' gender but also the gender stereotyping of executive functions at the top executive level. The framework we present in this section consists of three interrelated arguments. First, we postulate that some executive functions are considered more masculine than others. Second, we argue that more masculine executive functions are associated with higher pay. Third, we explain why female executives in highly masculine functions experience a backlash effect in pay as a result of fitting poorly with gender stereotypes.

4.2.1 Gender stereotyping of executive functions

In general, men are perceived to be better suited for executive positions than women, a phenomenon famously summarized by the phrase "think manager – think male" (SCHEIN/DAVIDSON 1993). This phenomenon is based on the common association between traits supposedly required for executive positions and attributes considered masculine. For example, executives are expected to be achievement-oriented, self-assertive, and decisive (e.g. KULICH et al. 2011; PRENTICE/CARRANZA 2002). These traits are considered stereotypically masculine qualities. In contrast, compassion, caring, trustworthiness, and sensitivity are considered stereotypically feminine traits which are, in general, deemed less relevant for executives (e.g. EAGLY/KARAU 2002; RUDMAN/PHELAN 2008). Thus, men are held to provide a better fit to executive positions than women (e.g. AGUT/HERNÁNDEZ BLASI/PINAZO 2022; HEILMAN et al.

2004; HENTSCHEL/HEILMAN/PEUS 2019). Given that executive pay reflects the fit between executives' characteristics and their position (WANG et al. 2019), female executives, in general, are expected to receive lower pay.

Top executives hold various functions. These functions have in common that they all imply management tasks at the highest organizational level, are equally complex, and require the same set of general management skills. Yet executive functions may vary in the degree to which they are *perceived* as stereotypically masculine because they are perceived to be associated with distinct responsibilities, different types of resources, and hence specific skill requirements (ALKADRY/TOWER 2011; CARPENTER/WADE 2002). The evaluation of executive functions is likely to be based on those aspects that are consistent with gender stereotypes (ENGLAND et al. 1988; STEINBERG 1990). For example, the operations function entails control over organizational resources and focuses on using resources effectively and efficiently. Therefore, we expect operations to be considered a rather stereotypically masculine function. On the other hand, more people-oriented executive functions, such as human resource management or communication, are more likely to be perceived as more feminine because they are associated to a substantial degree with stereotypically feminine qualities (UM et al. 2022). Hence, we propose that executive functions are gender stereotyped:

Proposition: Executive functions vary in the degree to which they are considered masculine.

4.2.2 Varying degrees of executive functions' masculinity and executive pay

Role congruity theory suggests that the executive gender pay gap is driven by the perceived discrepancy between the masculine qualities thought necessary to perform executive tasks and the stereotypical perceptions of women's traits (EAGLY/WOOD/DIEKMAN 2012; RUDMAN/PHELAN 2008). We seek to refine this notion. We argue that pay is higher for executive functions that are deemed highly masculine and lower for executive functions that are considered less masculine. There are two reasons for this: first, labor supply for highly masculine functions is lower than for less masculine functions, and second, higher value and prestige are attributed to highly masculine as compared to less masculine functions.

Concerning the first reason, we theorize that gender stereotypes prevent women from obtaining highly masculine functions but lead them to enter less masculine functions that are perceived to require feminine qualities. Evidence suggests that when advancing to top management, women tend to occupy functions that involve dealing with people (e.g., human resource management, communication) (BARBULESCU/BIDWELL 2013; KANTER 1977; KRAUS/YONAY 2000; STOJMENOVSKA/STEINMETZ/VOLKER 2021). At the same time, men are not viewed as "insufficiently feminine" for executive functions which are perceived to also require stereotypically feminine qualities (EAGLY/MAKHIJANI/KLONSKY 1992; RUDMAN/PHELAN 2008). Therefore, discrimination against women when hiring and self-selection of female executives reduce the supply of top management labor for highly masculine executive functions as compared to less masculine executive functions. For less masculine functions, by contrast, managers of both genders may advance to the top executive level, thus enlarging the talent pool for executive functions that supposedly also require stereotypically feminine qualities. A relatively tighter labor supply leads to higher pay for the more masculine functions (ACEMOGLU/AUTOR/LYLE 2004; DEZSŐ/LI/ROSS 2022)

As to the second reason, the gender stereotyping of executive functions leads to pay differences between executive functions because highly masculine functions are considered more valuable and prestigious than less masculine functions (MARKÓCZY/SUN/ZHU 2021). According to comparable worth approaches, the evaluation of relevant skills and responsibilities is gender-biased (PHILLIPS/TAYLOR 1980); highly masculine functions (e.g., those requiring technical expertise) are valued as more complex or relevant, while typically feminine functions (e.g., managing human relations or communicating to stakeholders) are valued less (e.g. ENGLAND/HERMSEN/COTTER 2000; STEINBERG 1990). Hence, the masculinity of executive functions is associated with higher value of the function and therefore higher executive pay. Similarly, expectation theory suggests that gender stereotypes entail status beliefs that associate greater status worthiness with men rather than women (e.g. RIDGEWAY 2001; WAGNER/BERGER 1997). In line with this notion, highly masculine executive functions tend to entail more authority and control over critical resources (CARPENTER/WADE 2002); they are regarded as more prestigious.

Furthermore, organizations meet various demands to become more "feminine" by creating new functions that score low in masculinity. This demand derives partly from the perception that management and leadership must put a stronger emphasis on stereotypically feminine qualities such as interpersonal skills and relationship management (RUDMAN/PHELAN 2008) and partly from political pressure to increase the share of women in executive positions (LEWELLYN/MULLER-KAHLE 2020; TERJESEN/AGUILERA/LORENZ 2015). Both trends have led organizations to create new executive functions which are associated with stereotypically feminine qualities (STOJMENOVSKA/STEINMETZ/VOLKER 2021), such as, for instance, the Chief Corporate Social Responsibility Officer. These newly established, less masculine executive functions are considered less prestigious as compared to "traditional", highly masculine executive functions (REICHEL/SCHEIBMAYR/BRANDL 2020).

As a consequence of the comparatively lower labor supply and the comparatively higher value and prestige, highly masculine executive functions receive higher financial rewards (e.g. AGUT/HERNÁNDEZ BLASI/PINAZO 2022; EAGLY 1987; RUDMAN/KILIANSKI 2000; STEINBERG 1990). In sum, we hypothesize:

H1: The more stereotypically masculine the executive function, the higher the executive pay.

4.2.3 Backlash for women in highly masculine executive functions

According to role congruity theory, women can reduce the incongruence between stereotypical beliefs about female characteristics and the traits required for executive positions by self-selecting into the less masculine executive functions (e.g. EAGLY/KARAU 2002; PARKER/MUI/TITUS 2020). However, these functions tend to be paid less well.

When female executives work in highly masculine executive functions instead, they will often experience backlash, in terms of feedback and pay, for not complying with prescribed gender role norms (RUDMAN 1998). Female executives are penalized for acquiring functions that are incongruent with prescribed gender-based expectations (e.g. FERGUSON 2018; VIAL/NAPIER/BRESCOLL 2016). We generalize this proposition and theorize that perceived incongruence is a matter of degree – the more masculine an executive function, the more incongruent it is with prescribed female gender norms. The proposition that incongruity will meet a backlash is supported by prior empirical

research. Female executives exhibiting stereotypically masculine qualities receive more negative evaluations from market investors (e.g. JEONG/HARRISON 2017), subordinates (HEILMAN/OKIMOTO 2007), and colleagues (e.g. KEEVES/WESTPHAL 2021; KIM/MEISTER 2023). Consequently, female executives in highly masculine functions may be offered lower pay. In addition, they might refrain from negotiating a higher salary (which would again be perceived to be a more masculine trait) because they fear even more negative reactions from stakeholders (e.g. BOWLES/BABCOCK/LAI 2007; RUDMAN/PHELAN 2008).

Overall, more masculine executive functions tend to be associated with higher pay, but female executives in such functions tend to earn less due to a backlash effect. Therefore, we hypothesize:

H2: There is an interaction effect between masculinity of the executive function and gender, such that women in more masculine executive functions tend to earn less.

Taken together, our hypotheses imply that there is a Catch 22 situation for female executives: Either they are paid less because they hold a less masculine function that is more congruent with gender role expectations or they hold a highly masculine executive function (which is usually better paid), but then they will receive a pay penalty for having violated gender role expectations.

4.3 Data and method

4.3.1 Data and sample

We test our hypotheses on unbalanced panel data comprising 999 executive-year observations by 353 top executives for the period of 2014 to 2018. The data covers all publicly listed firms from the Euro Stoxx 50 and Stoxx Europe 50 indexes, with some firms being listed in both indexes.

We have information on 84 firms located in eleven European countries (Belgium, Demark, Finland, France, Germany, Ireland, Italy, Netherlands, Spain, Switzerland, United Kingdom). Thus, our data set comprises observations from countries that have a one-tier governance structure (Belgium, Ireland, Italy, Spain, United Kingdom) and countries that have a two-tier governance structure (Germany), with the so-called Nordic system (Finland) being somewhere in between, but closer to a two-tier governance

structure.[6] In a one-tier governance structure, top executives and non-executive directors jointly sit on one board, whereas in a two-tier governance structure, top executives and non-executive directors are strictly separated from one another. In any case, our study refers to top executives exclusively and not to non-executive directors.

For our analysis, we combine field data at executive- and firm-level with self-collected data on top executives' education and from a self-conducted survey that provides information on the gender stereotyping of executive functions.

The field data comes from two sources: We follow SCHNEIDER/ISEKE/PULL (2021) and use executive-level data provided by hkp/// group GmbH (www.hkp.com), a consulting firm based in Frankfurt (Germany), who collect pay data from annual reports and other publicly available sources (www.boardpay.com). The data comprises biographical information on the top executives, such as full names, birth year, date of entry to the firm and to the function of top executive, their executive function titles as well as the pay elements (base salary, short-term incentives, long-term incentives, and special benefits). In addition to executive-level information, the hkp/// data set also includes some firm-level information such as the observation year, firm name, and industry.

Our data is uniquely suited to test our hypotheses for two reasons: First, it contains a highly nuanced itemization of the different executive functions at the top executive level and additionally accounts for possible accumulations of offices by including up to four functions per top executive. Secondly, European data holds the advantage of comparatively high pay disclosure standards. Most countries require a detailed compensation report on each top executive, irrespective of their function, which allows us to fully exploit the available information on the top executives' functions. By uniquely assembling highly differentiated data on top executives' functions *and* their pay, our data base is perfectly suited for the analysis of our research question.

[6] In some of the countries covered (Denmark, France, the Netherlands, Switzerland) firms may also choose between different governance structures. Further, the firms in our data set may choose to be incorporated as a so-called *Societas Europaea* (S.E.), which gives them leeway in their choice of a governance structure – independent of the country where its headquarters are located.

We used Thomson/Refinitiv as primary source for the additional firm-level information that was not provided by hkp/// group GmbH and retrieved performance and size measures, including the firms' market capitalization and ROE. All monetary information is conversed to Euro.

The self-collected data on top executives' education was retrieved from LinkedIn, firms' annual reports and Market Screener.

To obtain information on the public beliefs about the gender stereotyping of executive functions, we conducted a survey in the fall of 2021 via the crowdsourcing platform Prolific. Prolific allows for an integrated pre-selection from the pool of participants, i.e., only those meeting the selection criteria are notified about the survey. We pre-selected respondents with regards to two criteria: employment status and language proficiency. Firstly, we only included the working population, i.e., only full- or part-time working people were able to participate in the survey. The purpose of this selection was to recruit only participants having some experience in the corporate context to heighten the general familiarity with corporate areas of responsibility. Secondly, to minimize language barriers, only respondents proficient in German were admitted as this was the language used in our survey.

To meet a high data quality standard, we included attention checks to control whether participants were focused while taking the survey. Failed attention checks led to an exclusion of the participant's response from our data set. We additionally examined each submission for low-effort responses. Participants with a completion time below the average completion time by more than twice the standard deviation were discarded, as well as participants that indicated the same response on each of the items, i.e., that had a variance of zero in their answers.

The final sample of 202 respondents consists of 116 males, 85 females and 1 non-binary person. Their age ranges from 20 to 63 years, with an average of 33.32, and professional experience ranges from 1 to 42 years, with an average of 10 years. While

107 participants are native to German-speaking countries (Germany, Austria, Switzerland), 21 other nationalities are represented in our sample.[7]

Respondents were asked to evaluate the masculinity of the 19 different executive functions included in the executive-level data on a 5-point-Likert scale. Specifically, participants were given the following instruction: "In large companies, the multitude of management tasks is often divided into different areas of responsibility. Please rate the extent to which the following areas of responsibility are generally considered typically masculine or typically feminine." Thereafter, participants rated the masculinity of each given function from one to five. To enhance comprehensibility, we translated the executive function titles into executives' areas of responsibility (e.g., 'overall management of the firm' for the Chief Executive Officer or 'legal advice and representation' for the Chief Legal Officer). We did so for two reasons: First, describing areas of responsibility reduces the required business literacy of the survey participants, as functional titles might be too abstract to grasp. Second, taking into account that diverging titles are used in practice to describe the same executive function, naming the areas of responsibility instead of the functional titles harmonizes the description of roles. A short pre-test helped us to validate that the descriptions of areas of responsibility are clearly assignable to the respective executive functions. We examined the between-observers reliability of our measure by inspecting, for each executive function, the standard deviation of masculinity ratings provided by the 202 respondents. The average standard deviation of the ratings across all executive functions is 0.821. Considering that the Likert scale only returns integer values, and the possible responses only proceed in units of one, we are confident that our measures are adequately reliable across respondents.

[7] Belgium, Brazil, Bulgaria, France, Greece, Hungary, Italy, Luxembourg, Malaysia, Mexico, Netherlands, Philippines, Poland, Portugal, Romania, Russia, Slovenia, Spain, UK, Ukraine, US.

4.3.2 Variables

As dependent variable, in accordance with the literature (e.g. GREGORY-SMITH/MAIN/O'REILLY 2014; SCHNEIDER/ISEKE/PULL 2021), we use the natural logarithm of an executive's direct pay, that is, the sum of the base salary, short-term incentives (STI), and long-term incentives (LTI).

Our two main explanatory variables are executives' gender and the masculinity of the functions they perform. *Female* is a dummy variable that turns one if an executive is female and zero otherwise. Among the 353 executives in our data set, 36 are women.

We build our *masculinity* variable in two steps. First, we obtain a masculinity score for each of the 19 executive functions based on our survey data by taking the mean of the masculinity ratings per executive function over the 202 respondents and then normalizing these values to the value range from zero to one for easier interpretability. Zero indicates the least masculine function (in our sample, the Chief Communication Officer) and one denotes the most masculine function (in our sample, the Chief IT Officer). Secondly, as some executives hold more than one function, we calculate the *masculinity* of an executive's function(s) as the mean of the masculinity scores of all functions an executive holds at a given point in time. To test H2, we also include the interaction term of both explanatory variables.

In accordance with the literature, we control for a set of variables. At the executive level, we control for executives' age as well as the squared term of their age to capture potentially decreasing human capital effects (e.g. DEZSŐ/LI/ROSS 2022; PISSARIS/HEAVEY/GOLDEN 2017). Additionally, we include a dummy indicating whether they have been internally recruited (SCHNEIDER/ISEKE/PULL 2021) and the executives' tenure, i.e., for how long they have been a top executive in their firm (e.g. ELKINAWY/STATER 2011). That is, their tenure changes over the years and with a change between firms, but not with a change in their executive function within a firm. Lastly, we control for human capital via formal education (e.g. CARPENTER/WADE 2002) by including dummies indicating the highest degree an executive has earned. The categories are high school diploma, bachelor's degree (serving as reference category), master's degree (including MBA) and a PhD or doctoral degree.

Firm-level controls are included as well, as executive pay and the gender pay gap have been shown to be contingent on firm-level factors (SMITH/SMITH/VERNER 2011).

We account for firm size by using the natural logarithm of market capitalization (e.g. CHEN/TORSIN/TSANG 2022). Moreover, after winsorizing the Return on Equity (ROE) at the 1 and 99% percentiles to discard outliers and negative values, the natural logarithm of ROE serves as a control for firm performance (ALBANES/OLIVETTI/PRADOS 2015; BONET/CAPPELLI/HAMORI 2020; PISSARIS/HEAVEY/GOLDEN 2017).

4.3.3 Empirical strategy

We test our hypotheses with a pooled OLS regression model and include firm fixed effects to capture any firm-specific pay trends. These absorb time-constant factors, such as governance structures, and also industry-related factors, such as potential self-selection of women into the lower-paying industries. Furthermore, firm fixed effects account for country effects, i.e., differences in pay policies. We also incorporate year fixed effects to control for exogenous time-specific shocks that might influence executive pay. Because most executives are included in the regressions more than once, we cluster the standard errors at executive-level to assure that observations by the same executive are not regarded as fully independent from one another.

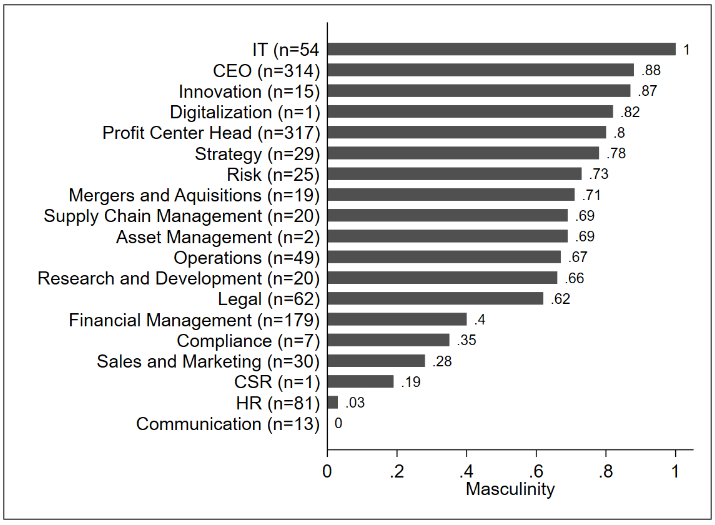
4.4 Results

4.4.1 Descriptive statistics

Figure 4.1 shows the masculinity scores (ranging from zero to one) of the 19 functions in our data set and includes their number of observations. The latter does not take into account whether the function is executed as primary, secondary, tertiary, or quaternary function, which is why the total exceeds the number of executive-year observations in our sample.

Figure 4.1 provides strong evidence for our proposition according to which there is gender stereotyping at the executive level. There are very strong differences in perceived masculinity; the IT function was rated highest in terms of masculinity, and communication the lowest. The overall pattern is consistent with what we as authors expected to be the prevailing stereotypes, with one notable exception. Financial management was not considered a very masculine function, with a score of 0.4.

Figure 4.1: Masculinity by function (including number of observations)



Because the masculinity of an executive function has not been used to explain the gender pay gap at top executive level and to further probe into its' validity, we juxtapose the masculinity score of the function to two other measures that – according to our theory – should be empirically related, namely a function's prestige and the share of women that hold the respective function. The masculinity score is unrelated to the share of female top executives in the respective function ($r=-0.01$, n.s.), indicating that it is not associated with the selection and self-selection of women in top executive functions. But in line with expectation theory, we find that the masculinity of a function is significantly correlated to a function's prestige[8] ($r=0.47$, $p<0.05$), suggesting that the higher the masculinity score of an executive function, the higher the prestige

[8] To measure prestige, we elicited the general public's perceived prestige of different executive functions with the help of a second survey which we also conducted in the fall of 2021. Recruitment, setup, participation requirements, and data quality checks are identical to the survey on masculinity; yet we surveyed a distinct sample. Again, we have 202 final responses, albeit from different respondents because participants in one survey were prevented from participating in the other to avoid any priming effects. In the prestige survey, participants were asked to rate how prestigious a certain executive's area of responsibility is generally considered in comparison to the other executives' areas of responsibility, ranking from 'high' to 'low'. As not all participants fully exploited the 5-point-Likert scale, we standardized the indicated prestige values per participant to make them comparable amongst participants. We then took the mean per function over all participants and normalized them to the value range of zero to one, zero signifying that a function is least prestigious (in our sample, the Chief Supply Chain Management Officer) and one describing the most prestigious function (in our sample, the Chief Executive Officer). As a result, this survey yields a prestige score for each of the 19 functions of our data set. Further, we also measure the share of women in each executive function in our data set (female share).

of the respective function. The latter finding lends some additional support to our masculinity measure.

Table 4.1 next displays summary statistics and correlations of the variables we use for our main analysis as well as any further analyses or robustness checks, all of which are at the executive level. There is a negative correlation between our two main explanatory variables *female* and *masculinity*, which hints at women being under-represented in highly masculine executive functions. None of the variables used in the main analysis correlate very highly, thus not raising any concern over potential collinearities.

Table 4.1: Summary statistics and correlations

Variables	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Female	.08	.28	0	1	-												
(2) Masculinity	.69	.23	0	1	-0.22***	-											
(3) Masculinity (maximum)	.73	.23	0	1	-0.20***	0.91***	-										
(4) Masculinity (minimum)	.65	.27	0	1	-0.19***	0.92***	0.68***	-									
(5) Log (direct pay)	15.06	.53	12.77	17.30	-0.14***	0.31***	0.27***	0.29***	-								
(6) Log (base salary)	13.81	.44	12.21	15.16	-0.13***	0.3***	0.30***	0.34***	0.68***	-							
(7) Log (STI)	13.58	.80	7.72	15.45	-0.05	0.191***	0.17***	0.17***	0.59***	0.34***	-						
(8) Log (LTI)	14.23	.79	7.44	17.24	-0.09***	0.22***	0.18***	0.20***	0.87***	0.55***	0.32***	-					
(9) Age	55.72	5.12	39.00	71.00	-0.14***	0.20***	0.17***	0.19***	0.29***	0.26***	0.20***	0.23***	-				
(10) Internally recruited	.74	.44	0	1	-0.08**	0.13***	0.12***	0.11***	0.01	0.02	-0.01	0.02	-0.04	-			
(11) Executive tenure	6.42	4.77	1	30.26	-0.17***	0.23***	0.26***	0.17***	0.34***	0.25***	0.24***	0.26***	0.43***	0.09***	-		
(12) Log (market capitalization)	24.78	.60	23.32	26.18	0.01	-0.02	-0.06*	0.02	0.40***	0.18***	0.21***	0.38***	0.03	0.05*	0.05	-	
(13) Log (ROE)	2.63	.72	.228	4.57	0.02	-0.08**	-0.08**	-0.07**	0.12***	-0.08***	0.23***	0.03	-0.06*	0.02	0.14***	0.36***	-

**** p<0.01, ** p<0.05, * p<0.1, N=999*

Note: „Masculinity“ measures the average masculinity of the functions held by an executive (used in main regression); “masculinity (maximum)” measures the maximum masculinity of the functions held by an executive and “masculinity (minimum)” measures the minimum masculinity of the functions held by an executive (used in robustness analyses).

4.4.2 Main results

Table 4.2 reports the results of the main regression analyses. The consecutive inclusion of the control and explanatory variables allows us to check for an improvement of the explanatory power of our model. Model 1 contains only the control variables and the *female* variable to check for the existence of a gender pay gap. In Model 2, we add *masculinity* to test whether the perceived masculinity of the functions held by an executive helps explain executive pay (H1). Model 3 additionally includes the interaction term of our two explanatory variables to test whether female executives are penalized for occupying functions stereotyped as masculine (H2). In this final model, we can assess whether and to what extent the masculinity of executive functions contributes to the gender pay gap.

Model 1 suggests the existence of a significant (β=–0.097; $p<0.01$) gender pay gap in our data set. Given our log-linear regression, the coefficient is equivalent to a discount of 9.24% for female top executives, after controlling for executive- and firm-level characteristics as well as firm and year.

Model 2 addresses H1 by testing for an effect of *masculinity* on executive pay. The coefficient (β=0.514; $p<0.01$) is significant and positive and thus supports H1. The coefficient translates into a pay premium of 67.19% for the most masculine function as compared to the least masculine one. Simultaneously, we observe a decrease of the gender pay gap in size and a loss of significance. Hence, the substantial part of the gender pay gap in Model 1 is explained by women holding less masculine executive functions.

Finally, Model 3 also includes the interaction term between the two explanatory variables *female* and *masculinity*. It is designed to test H2, which predicts a negative coefficient for the interaction term. The respective coefficient (β=–0.519; $p<0.01$) is negative and statistically significant and thus points toward a pay penalty for female executives in masculine functions as compared to their male counterparts, thus supporting H2. For the most masculine function, this pay penalty amounts to 40.49%. At the same time, the coefficient for *masculinity* increases and remains highly significant (β=0.604; $p<0.01$), suggesting that the link between the masculinity of the functions held by an executive and an executive's pay we observed in Model 2 was in fact driven by the male executives. When including the interaction term, the coefficient for *female*

turns positive (β=0.253; p<0.01), hinting at female executives in the least masculine (and less-well paid) functions to obtain a pay premium compared to their male colleagues.

Table 4.2: Main results

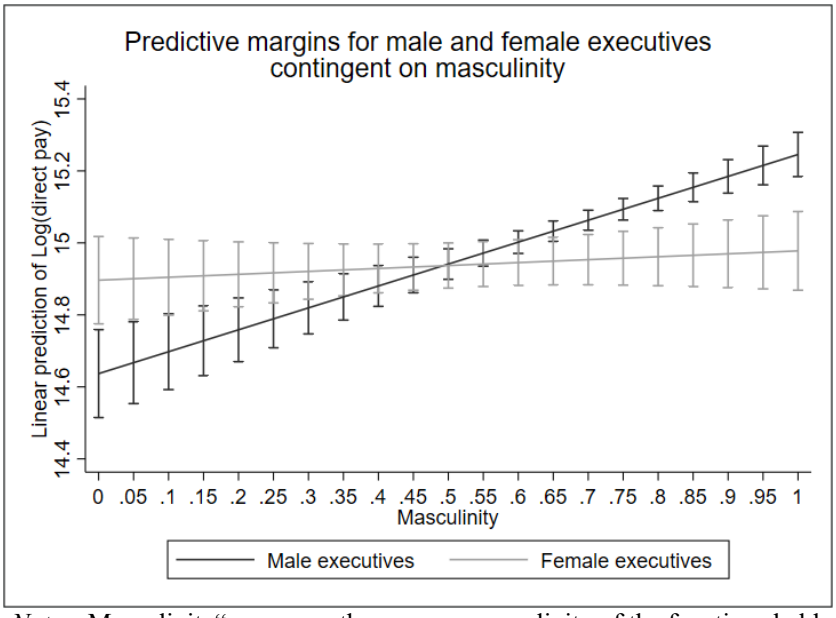
	(1)	(2)	(3)
Dependent variable=	Log (direct pay)	Log (direct pay)	Log (direct pay)
Explanatory variables			
Female	-0.097***	-0.027	0.253***
	(0.035)	(0.042)	(0.086)
Masculinity		0.514***	0.604***
		(0.075)	(0.088)
Female * Masculinity			-0.519***
			(0.131)
Control variables			
Age	0.079	0.074	0.076
	(0.054)	(0.048)	(0.047)
Age^2	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)
Internally recruited	-0.021	-0.052	-0.058
	(0.043)	(0.039)	(0.039)
Executive Tenure	0.041***	0.036***	0.036***
	(0.006)	(0.005)	(0.005)
Education			
High school diploma	-0.001	-0.066	-0.045
	(0.106)	(0.097)	(0.092)
Master's degree	0.033	0.038	0.049
	(0.045)	(0.042)	(0.040)
PhD/Doctoral degree	-0.051	-0.025	-0.003
	(0.057)	(0.054)	(0.054)
Log (market capitalization)	0.210***	0.235***	0.234***
	(0.065)	(0.065)	(0.065)
Log (ROE)	0.067**	0.077**	0.078***
	(0.029)	(0.030)	(0.029)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Constant	6.990***	6.208***	6.115***
	(2.172)	(2.029)	(2.015)
Observations	999	999	999
R-squared	0.720	0.757	0.762

Standard errors clustered at individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Notes: „Masculinity" measures the average masculinity of the functions held by an executive. The reference category for education is a bachelor's degree.

The interaction effect is visualized in Figure 4.2 and highlights the Catch 22 situation. Female executives receive a pay premium in the least masculine functions,

though confidence intervals indicate that the premium is only barely statistically significant. The crossover point of the two lines is located close to 0.4: the masculinity score for financial management. Women in financial management earn 2.9 million €, men 3.1 million €, and the difference is not statistically significant. In the upper ranges of the masculinity spectrum, women then clearly suffer from a pay penalty, which is statistically significant. As this implies, by occupying more masculine executive functions, female executives can improve their pay only to a very low degree. At the same time, male executives can substantially improve their pay by selecting into more masculine functions.

Figure 4.2: Interaction effect



Note: „Masculinity“ measures the average masculinity of the functions held by an executive.

4.4.3 Robustness checks

We offer several robustness checks. First, we vary the dependent variable and separately look at different pay components. Second, we propose alternative measurements of our explanatory variable *masculinity*. Third, we vary our sample by restricting it to the executives who do not hold the function of the CEO. Fourth, we re-run our main regression with industry and country fixed effects and standard errors clustered at these levels. Finally, we control for a potential sample bias caused by the unbalanced panel.

First, since pay gaps between male and female top executives may differ between pay components (ALBANESI/OLIVETTI/PRADOS 2015), we re-run separate regressions for base salary, LTI, and STI respectively. The results are tabulated in Table 4.3. Model 4 regresses the logarithm of the base salary on our explanatory and control variables, Model 5 uses the logarithm of STI and Model 6 the logarithm of LTI as dependent variable. The sample size is reduced to n=935 in Model 5 and to n=962 in Model 6 because not all firms offer both STI and LTI, and more importantly, some executives have not earned their incentive pay as their performance period has not ended yet.

All of the models show the same tendency as our main specification: Female executives receive a pay premium in the least masculine functions but are penalized if they hold more masculine functions, despite the general positive effect of a function's masculinity on the pay components (which is driven by the male executives).

Compared to our main analysis, the significance level of the *female* dummy slightly decreases for the base salary and LTI regressions, thus hinting that female pay premium is rather driven by the STI, whereas their pay penalty in masculine functions – statistically – rather stems from base salary and STI. Hence, in the separate regressions, role congruity remains a relevant predictor for the pay backlash, even when performance-based components of pay are evaluated separately.

Second, we vary the specification of our *masculinity* variable. One might argue that the masculinity of the set of functions held by an executive should not be calculated as the *average* of the masculinity scores of the different functions. For instance, a Chief IT Officer who is, in addition, also in charge of HR and/or CSR, might not be perceived to hold a less masculine function than a Chief IT Officer who does not hold an additional function. Rather, the high masculinity of the Chief IT Officer function might "dominate" the low levels of masculinity associated with the HR and the CSR function. Alternatively, a function scoring rather low in masculinity might dominate the perception of other functions that the executive holds at the same time.

Table 4.3: Pay elements

Dependent variable=	(4) Log (base salary)	(5) Log (STI)	(6) Log (LTI)
Explanatory variables			
Female	0.181**	0.276***	0.246**
	(0.078)	(0.097)	(0.112)
Masculinity	0.514***	0.585***	0.622***
	(0.073)	(0.104)	(0.101)
Female * Masculinity	-0.353***	-0.462***	-0.435**
	(0.115)	(0.159)	(0.170)
Control variables			
Age	0.065*	0.086	0.024
	(0.035)	(0.068)	(0.082)
Age^2	-0.001*	-0.001	-0.000
	(0.000)	(0.001)	(0.001)
Internally recruited	-0.061*	-0.054	-0.042
	(0.032)	(0.050)	(0.046)
Executive tenure	0.029***	0.036***	0.039***
	(0.005)	(0.006)	(0.006)
Education			
High school diploma	-0.056	-0.062	0.005
	(0.107)	(0.143)	(0.097)
Master's degree	0.044	0.011	0.082*
	(0.034)	(0.051)	(0.046)
PhD/Doctoral degree	0.002	-0.057	0.038
	(0.046)	(0.067)	(0.066)
Log (market capitalization)	-0.006	0.564***	0.453***
	(0.037)	(0.095)	(0.153)
Log (ROE)	0.017	0.238***	-0.042
	(0.017)	(0.044)	(0.046)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Constant	11.379***	-3.811	1.525
	(1.346)	(2.848)	(3.549)
Observations	999	935	962
R-squared	0.795	0.792	0.763

Standard errors clustered at individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Note: „Masculinity" measures the average masculinity of the functions held by an executive.

To allow for different ways of how the masculinity of the set of functions held by an executive is perceived, we ran two robustness checks where we measure the masculinity of the set of functions held by an executive in two alternative ways, namely as the most masculine function only (Model 7) and the least masculine function only (Model 8). The results are shown in Table 4.4.

Table 4.4: Alternative specifications of the explanatory variable

Dependent variable=	(7) Log (direct pay)	(8) Log (direct pay)
Explanatory variables		
Female	0.243***	0.130*
	(0.092)	(0.070)
Masculinity (maximum)	0.567***	
	(0.090)	
Female * Masculinity (maximum)	-0.474***	
	(0.129)	
Masculinity (minimum)		0.428***
		(0.072)
Female * Masculinity (minimum)		-0.353***
		(0.117)
Control variables		
Age	0.080*	0.078
	(0.048)	(0.048)
Age^2	-0.001*	-0.001
	(0.000)	(0.000)
Internally recruited	-0.049	-0.054
	(0.041)	(0.039)
Executive tenure	0.035***	0.039***
	(0.005)	(0.005)
Education		
High school diploma	-0.027	-0.052
	(0.092)	(0.102)
Master's degree	0.044	0.048
	(0.042)	(0.041)
PhD/Doctoral degree	-0.022	-0.005
	(0.054)	(0.054)
Log (market capitalization)	0.255***	0.206***
	(0.065)	(0.067)
Log (ROE)	0.064**	0.089***
	(0.029)	(0.029)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Constant	5.573***	6.816***
	(2.049)	(2.055)
Observations	999	999
R-squared	0.755	0.752

Standard errors clustered at individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Note: "Masculinity (maximum)" measures the maximum masculinity of the functions held by an executive and "masculinity (minimum)" measures the minimum masculinity of the functions held by an executive.

Our main results hold and remain highly significant, independently of how we assess the masculinity of the functions held by an executive. In view of the highly

positive correlation coefficients of these alternative measures with our baseline masculinity measure (see Table 4.1), this does not come as a surprise. In sum, we are confident that our results are not driven by how we conceptualize the masculinity of the set of functions held by an executive.

Third, we re-run the regressions with a sample excluding the CEOs. This decreases the number of individual-year observations to 685. The coefficients keep their respective signs but are reduced in size and turn insignificant, except for *masculinity*, which remains significant at the 5%-level. This decrease in size and significance is not surprising because of the loss of power. Yet, by keeping the CEOs in the sample, we are able to demonstrate that the Catch 22 situation holds for all executive functions *including* the CEO. In fact, the gender pay gap at the CEO function in our sample happens to be sizeable: Female CEOs are on average paid 2.24 million € less than male CEOs ($p<0.1$).

Fourth, we re-run our main regression with industry and country fixed effects and standard errors clustered at the industry- and country level to account for possible correlations between the cluster-units. For all of the above units, specific unobserved executive pay policies might be in place. Our results hold under all specifications.

Finally, as we have an unbalanced panel data set, non-random missing of observations might be an issue leading to sample bias. Therefore, we apply the procedure recommended by (WOOLDRIDGE 2010) and previously used in the literature (e.g. BERRONE/GOMEZ-MEJIA 2009). More particularly, we integrate a selection indicator in the regression model, which specifies the missing executive-year observations. This indicator dummy is a lagged variable and turns one if an individual is included in the sample in the previous year and zero otherwise. We find the indicator variable to be insignificant in our model, and this suggests that the unbalanced nature of the panel is not a concern (BERRONE/GOMEZ-MEJIA 2009; WOOLDRIDGE 2010).[9]

[9] We also run our main regression model on the balanced sub-sample (BERRONE/GOMEZ-MEJIA 2009), i.e., only those executives observed in each period. Albeit this drastically reduces sample size and significance levels, the explanatory variables all keep their respective signs and show roughly the same coefficient sizes.

4.5 Discussion

4.5.1 Main findings and contributions

Based on an analysis of 353 top executives of large firms in Europe in the period 2014 to 2018, this paper has produced two main findings. First, executive functions that are stereotyped as more masculine are paid better than functions that are stereotyped as less masculine. Second, female top executives are penalized in more masculine functions, which are less role congruent for women. These findings are important as they help us to understand the surprising fact that a considerable gender pay gap at the top executive level is persistent even at a time when more women are appointed to top executive positions in Europe, and when society and public policy makers are sensitized about pay (in-)equality. The gender pay gap at the top executive level is often attributed to gender stereotypes that work against women's pay (ALBANESI/OLIVETTI/PRADOS 2015; SCHNEIDER/ISEKE/PULL 2021). Except for CHEN/TORSIN/TSANG (2022), who link CEO pay to country-level gender equality, there is few direct evidence on the existence of such stereotypes and on their association with pay. The two main findings of this paper clearly shed light on both these issues.

The first finding – the pay premium for more masculine functions – significantly adds to the sketchy knowledge of gender stereotypes at the top executive level. MARKÓCZY/SUN/ZHU (2021) show that the status hierarchy among top executives is gendered. We demonstrate that there is a similar status hierarchy among executive functions (not individual members), with more prestigious functions considered to be more masculine. Hence, consistent with MARKÓCZY/SUN/ZHU (2021), our paper implies that status and masculinity are positively correlated. We also extend the work by REICHEL/SCHEIBMAYR/BRANDL (2020), who argue that HRM is considered less masculine than other executive functions. Our survey results show that this assumption is warranted – and that the perceived masculinity also varies between the whole range of executive functions commonly found at the top executive level. In other words, our findings provide a more nuanced version of the "think manager – think male" phenomenon.

The second finding – the penalty of women in masculine functions – indicates that comparing executive functions is key to understanding the gender pay gap for top executives. DEZSŐ/LI/ROSS (2022) study the effect of a female CEO on the gender pay

gap. They document substantial differences in pay between executive functions but do not relate them to gender stereotypes or pay differences by gender. According to our paper, the executive function should not be treated as a control variable but instead as a key determinant of the gender pay gap. CARPENTER/WADE (2002) also find pay differentials between executive functions. They attribute them to the strategic importance a function holds. Our paper suggests that these differentials might be explained by, or at least correlated to, a function's perceived masculinity. An interesting suggestion, then, is that strategic importance might itself be a gendered concept – a certain function is valued highly not only because of its objective impact on firm strategy and performance but also because of a broadly held subjective belief in its "masculinity".

Our paper also enriches the broader literature on the societal evaluation of work and the resulting gendered pay structures. It is well documented that occupations differ in terms of prestige, perceived masculinity, and pay (BUSCH/HOLST 2011; LEVANON/ENGLAND/ALLISON 2009; TAM 1997). We uncover equivalent differences, so far overlooked, between the different functions at the top executive level. One might argue that the perception of functions at the top executive level simply mirrors the perception of tasks in broader society. But the strong gender stereotypes we observe are surprising given the type of work conducted by top executives. Though, for example, the IT function and the communication function each require considerable field-specific expertise, their tasks (as that of all executive functions) strongly overlap: All top executives negotiate and collaborate in various team constellations, they convince followers and represent the firm vis-à-vis other stakeholders, and they make informed decisions. Arguably, the top executive's task profiles overlap more strongly than that of occupations in general, but perceived masculinity and pay vary substantially.

Furthermore, we also find that women are penalized in terms of pay for holding more masculine, role-incongruous functions. Though this – again – is similar to jobs in general (HEILMAN/OKIMOTO 2007), it is surprising to see the pattern evolve so clearly in our context – pay for the top-level jobs is highly regulated and it is visible on an individual basis to the general public. Even more than other occupations, therefore, work at the top executive level uncovers the gendered beliefs in society on what constitutes male and female work – and how each is valued and paid in comparison.

4.5.2 Limitations and routes for future research

A number of limitations of our paper point to particular routes for future research. First, our survey on the masculinity of functions was designed specifically to measure the respective societal beliefs. We found surprisingly strong differences in terms of perceived masculinity between functions, and these differences were consistent between the 202 respondents, including the 105 respondents taking the survey from countries other than the German-speaking countries Germany, Austria, or Switzerland. Future work could examine possible cross-country divergences in terms of masculinity perceptions and resulting gender pay gaps. CHEN/TORSIN/TSANG (2022) have shown already that national divergences in terms of gender equality are linked to the gender pay gap at the CEO level. For the broader set of functions, too, we would expect there to be nuanced cross-country divergences in terms of perceived masculinity and resulting pay differences. Future studies should use not only larger samples but deliberately choose countries whose norms related to gender and inequality are known to vary.

Second, we cannot completely rule out that the pay differences between male and female top executives are influenced by other factors that correlate with masculinity. In particular, unobserved heterogeneity in terms of human capital endowment may be gendered in a way that is correlated with the masculinity of executive functions. The market-based view generally explains the pay penalty for female members with their disadvantages in terms of human capital (HANDSCHUMACHER-KNORS 2023; MURPHY/ZÁBOJNÍK 2004). In our context, one might speculate that fewer women than men are in the corporate career pipelines that lead to stereotypically masculine functions. As a result, men who end up in more masculine functions could tend to hold, on average, more human capital than women in the same function. Though we do not claim to fully control for human capital endowment, we control for much of it by including formal education, age, and executive tenure as control variables. More fundamentally, other market forces beyond human capital endowment are at play, and these work towards higher, not lower pay for women at the top executive level. In particular, female candidates are high in demand because firms are under considerable pressure to nominate women. So, if anything, our findings underestimate the pay differentials between male and female top executives that can be attributed to gendered stereotypes. In line with our argument, REBÉRIOUX/ROUDAUT (2019), studying French firms, find pay

penalties for female top executives, and the penalties remain even after controlling for individual characteristics including education. Nonetheless, it would be helpful in future studies to combine more information on human capital endowment, such as the previous career, with data on the perceived masculinity of functions in order to disentangle the various effects potentially at work.

Third, we identified the effect of gender stereotyping on the gender pay gap at the top executive level in a way that leaves important questions of "how" and "why" unaddressed. The survey findings approximate societal beliefs on the evaluation of more or less masculine executive functions. Though they helped us to detect a gender pay gap attributable to societal gender stereotypes, we cannot reconstruct how this effect is transmitted from societal beliefs to pay inside the firms. At least two, not mutually exclusive transmission channels are plausible. First, more masculine functions could be perceived as being more strategically important and therefore granted more formal decision-making power than less masculine functions. Future work should therefore explore links between perceived masculinity, strategic importance, and formal power. As a second transmission channel, women can be appointed as token women to the top executive level but then concentrate in the more role congruous, less masculine, and less paying functions (REBÉRIOUX/ROUDAUT 2019; REICHEL/SCHEIBMAYR/BRANDL 2020). This latter effect would explain why a gendered pattern of pay may be sustained and perpetuated. Though the positive correlation of masculinity and prestige in our data suggest that this latter channel may be at work, we cannot be certain. Future work should explore this issue. For example, qualitative research might clarify possible reasons why nominating bodies end up predominantly assigning women to less masculine functions. More quantitative research could examine whether a higher share of female top executives does reduce the Catch 22 we documented.

4.5.3 Managerial and policy implications

Firm owners and members of nomination committees who nominate top executives should care about our findings. Gendered differences in terms of pay and status can be problematic for firms in a number of ways. The motivation to cooperate among top executives can be undermined because strong pay differentials can be detrimental to cooperation in the top management team (SIEGEL/HAMBRICK 2005), in particular

when the differentials are not based on justifiable criteria such as firm size (FREDRICKSON/DAVIS-BLAKE/SANDERS 2010). Believing a function to be more or less masculine is clearly off the list of justifiable criteria. Cooperation among top executives can also be harmed by status differences (MARKÓCZY/SUN/ZHU 2021). In our data, functions of low status tend to be less stereotypically masculine. Managers of such functions might find it difficult to be listened to in debates among top executives, and these functions are less attractive to the most able talents. In light of such effects, it is especially problematic that the functions with the lowest masculinity in our data are communication, human resources, and Corporate Social Responsibility – functions that are in charge of the "soft" resources supposedly crucial today for corporate legitimacy and success. Nominating bodies should carefully revise their practice. More women should be appointed not only to the top executive level in general but also to the more prestigious and stereotypically masculine executive functions, including the CEO. Nominating bodies should also ask whether formal power and alleged strategic importance they attach to particular functions really are rooted in objective facts. In light of our paper, they could be the result of gendered beliefs. Furthermore, firms stating that human resources or CSR functions are of utmost importance while paying these functions comparatively poorly may be considered as paying lip service.

Finally, our findings are relevant for public policy. Much like recent studies, they imply that a gender pay gap at the top executive level of European companies still exists (HANDSCHUMACHER-KNORS 2023; SCHNEIDER/ISEKE/PULL 2021). But our paper extends this work by suggesting specifically that beliefs in the masculinity of a function contribute to this gap. The pay patterns we find contain all three separate differences that have been suggested in some empirical studies to decompose pay inequality (BUSCH/HOLST 2011; PETERSEN/SAPORTA 2004): In our data, female top executives earn less in more masculine functions; hence there is a *within-job* pay difference. Female top executives are less often nominated for such masculine, well-paying functions, an *allocative* effect that contributes to a gender pay gap. Finally, functions considered less masculine are paid less for both men and women, suggesting a gendered *valuation of jobs*. In combination those three differences produce the Catch 22 – wherever they are, female top executives are unlikely to attain the very top pay levels.

The patterns in our data imply considerable inequalities for which policy makers should care. In our data, IT is the function considered to be the most masculine. In IT, male top executives make on average 3.3 million €, women only make 2.2 million €, and only 14 percent of IT top executives are women (compared to 28 percent in HRM). Rooted in gender stereotypes, these considerable inequalities in terms of female representation and pay are likely to be persistent. In France, for example, general quotas for women at the top executive level induce firms to nominate women into particular functions (REBÉRIOUX/ROUDAUT 2019), which in light of our findings are presumably the less masculine ones. In light of the Catch 22 we found, quotas for women at the top executive level will probably not erode pay differences by gender – they may actually increase them. When more women are appointed, they will concentrate in role congruent, less masculine functions – which are the less-paying ones. When they are appointed to more masculine functions, their pay will tend to be considerably lower than that of their male counterparts on account of role incongruity. Therefore, when general quotas for women at the top executive level are introduced, the gendered composition of functions and gendered pay structures can be reproduced or even aggravated. To avoid such unintended side effects of quotas, it might be considered to introduce complementary regulations concerning pay differences at the top executive level.

5. Perceived executive dominance and pay-performance-sensitivity[10]

5.1 Introduction

Since 2009, the median direct compensation of executives in S&P 500 firms has been steadily increasing within a range of 1 to 31% per year (WILLIAMSON 2023; BOUT et al. 2023). In the same period, the total shareholder return of these firms paints a very different picture, with highly volatile results and both positive and negative year-to-year developments – suggesting that changes in executives' direct compensation surpasses the changes in firm performance (WILLIAMSON 2023; BOUT et al. 2023). Surprisingly often, there is only a weak relation between executive compensation and firm performance (EDMANS/GABAIX 2009) and executive compensation seems to be progressively decoupled from firm value – at the expanse of shareholders (GERTH/ SCHÖNWITZ 2020).

This is contrary to the ideal scenario, in which changes in firm value and executive compensation should be closely connected such that executives have an incentive to act in the best interest of the shareholders. Since firm value and long-term well-being is highly contingent on executives' performance and depends on their daily operative decisions, the loose connection between executive pay and performance is concerning. This is even more striking in light of the internationally increasingly strict legal requirements on executive compensation and disclosure rules. For instance, the United States' Securities Exchange Act, as changed by the Dodd-Frank Act, was amended in 2022 to increase transparency on the link between executive performance and pay (U.S. SECURITIES AND EXCHANGE COMMISSION 2022). The European Union implemented the Amendment to the Shareholders' Rights Directive (EUROPEAN UNION 2017), which was to be enforced into national law in the membership countries by 2020. Some countries, like Germany, even accompanied these legal changes by releasing amended directives like the German Corporate Governance Code, stipulating –

[10] This chapter is based on joint work with STEFANIE EHMANN (University of Tübingen) and JULIAN NÜßLE (University of Tübingen): "Playing the Trump card: perceived dominance and pay-performance-sensitivity in executive compensation".

with a 'comply or explain' regulation – reasonable executive pay packages (REGIERUNGSKOMMISSION GCGC 2022). That is, executive compensation structures are bound to be based on executives' performance and their fostering of the firm's long-term well-being (ARNOLD/HERZBERG/ZEH 2021). It is therefore puzzling that firm value and executive compensation are empirically only loosely related.

Scholars refer to the underlying problem as the well-known principal-agent problem, a conflict of interest between executives and shareholders rooted in the separation of ownership and control in publicly listed firms (JENSEN/MECKLING 1976). While shareholders want executives to act in their interest and enhance firm value and dividends, executives seek to maximize their own welfare. The latter might consist in maximizing own financial gains or following an own agenda, both potentially inflicting harm to the shareholders. A typical tool to overcome this issue is the enforcement of an incentivizing executive compensation package. According to the principal-agent theory, executive compensation should be designed such that executives' interests are aligned with shareholders' interests, i.e. executive compensation should be contingent on shareholder wealth (DECKOP/MERRIMAN/GUPTA 2006). Under these assumptions, executives would hence maximize their own financial welfare by doing what's best for the shareholders' wealth.

Even though executive compensation arrangements should include variable short- and long-term incentives (MURPHY 2013) based on financial and non-financial measures of firm well-being (KOLK/PEREGO 2014), the pay-performance-sensitivity is – as observed – surprisingly weak (e.g. JENSEN/MURPHY 1990; GÖX 2016). In the past decades, researchers have therefore challenged the classical optimal contracting view by introducing the managerial power hypothesis and proposing that, in fact, executive compensation arrangements are the result of rent extraction by powerful yet risk-averse executives rather than effective incentive schemes (BEBCHUK/FRIED 2006). Empirically, the incentive intensity is estimated by the pay-performance-sensitivity, which is generally understood as the change in executive compensation associated with the change in firm value, i.e. shareholder wealth. In this context, a decoupling of executive compensation from firm value translates into low pay-performance-sensitivities, meaning that executive welfare is only weakly linked to shareholder wealth and rather independent of their job performance (JENSEN/MURPHY 1990).

An abundant amount of research has been conducted to explore the drivers of the weak pay-performance-sensitivity - but while the literature has primarily focused on firm and institutional characteristics as a boundary condition on the pay-performance-sensitivity (CHANG/CHOY/WAN 2012; GAO/LI 2015), it has largely overlooked individual executives' characteristics with only some exceptions, such as tenure (HILL/PHAN 1991). This might root in data availability, as it is hard to obtain individual information on executives. In particular, scholars have so far neglected psychological, trait-like individual differences that might represent a boundary condition on the pay-performance-sensitivity. In our paper, we seek to address this gap by looking into one particular individual component as possible driver of weaker observed pay-performance-sensitivity. Specifically, we argue that perceived dominance might be such a boundary condition that influences the strength of the link between change in firm value and change in executive compensation. Executives whose levels of dominance is perceived as high, "are assertive and motivated to lead, and thus control through the force of their personality" (ANDERSON/KILDUFF 2009: 491). Hence, executives who are perceived as dominant based on physical cues, might be able to impose their own interests in compensation negotiations (KAKKAR/SIVANATHAN/GOBEL 2020; NOSER/SCHOCH/EHLERT 2018). To empirically analyze our hypotheses, we draw back on an objective measure of perceived dominance, approximated by the facial Width-to-Height-Ratio (fWHR) (KAKKAR/SIVANATHAN/GOBEL 2020).

We contribute to current research in two ways. First, we provide a more psychological perspective on managerial power and add to the literature on the managerial power hypothesis by offering a new individual factor as a boundary condition that influences the strength of the pay-performance-sensitivity. Second, we borrow from psychological literature and introduce the fWHR as empirical measure to the business context, offering a measure for a different, more subtle source of managerial power.

The next section offers our theoretical framework based on the principal-agent theory to derive our first hypothesis and the managerial power hypothesis to derive our second hypothesis. Section 5.3 introduces our dataset, defines our variables and our estimation strategy. Based on 3,737 executive-year observations from German listed companies, section 5.4 presents descriptive statistics, our main estimations, robustness checks as well as a visualization of the moderating effect as formulated in our second

hypothesis. In section 5.5, we discuss our findings and offer limitations and recommendations for future research.

5.2 Theoretical framework

5.2.1 The pay-performance-sensitivity

Whether the two types of directors that are represented in corporate boards, i.e. executives and the non-executive directors, sit together on one board or constitute two separate organs depends on a firm's governance structure, which is mostly dependent on the country where a firm has its headquarters. In a one-tier (monistic) system, executives and non-executive directors together constitute the board of directors. In a two-tier (dualistic) system, executive and non-executive directors operate on two separate boards, i.e. the Executive Board and the Supervisory Board. The main task of the executives is the daily operative management of the firm. The non-executive directors are in charge of the general strategic positioning of the firm, the oversight and monitoring of the firm as well as the executives and hold a consulting position to the executives. (ALUCHNA 2023)

The organizational structure in publicly listed firms theoretically adheres to an arm's length approach, representing a typical principal-agent setting. The shareholders voting for the appointment of non-executive directors are the principals, while executives function as agents managing the firm at the behest of the shareholders. It is well known that a principal-agent problem could arise as a result, because executives and shareholders might have diverging interests. That is, executives might be inclined to follow their own agenda to maximize their own welfare instead of the shareholders' by engaging in self-serving hidden actions. Because shareholders bear the risks of the executives' decisions and actions while executives typically don't, this could lead to a Moral Hazard problem, e.g. executives taking unnecessary risks to pursue their own goals. (HOLMSTROM 1979; ALUCHNA 2023)

One approach to mitigate the arising problem is a thorough monitoring of the executives through the non-executive directors. Since this is, however, associated with high cost, incentive-alignment is used as a complementary remedy to the problem (HOLMSTROM 1979; GÖX 2016). Executive compensation serves as the primary incentive for that purpose. In a monistic system, executive pay packages are adopted by the

compensation committee, which is predominantly formed by non-executive directors, and by the Supervisory Board in the dualistic system (ALUCHNA 2023). That is, executive compensation packages are arranged such that the executives' resulting compensation is directly linked to firm value, which executives can influence through their performance. Following the optimal contracting approach, a change in firm value should thus be reflected accordingly in executive compensation to serve as an incentive to executives to work in favor of the shareholders' interests (HOLMSTROM 1979). The compensation structure should adequately reflect the impact of the executives' effort on firm value and transfer some of the risk of their choices to them, ultimately increasing their accountability for their decisions (HOLMSTROM 1979). This ensures that the shareholders are not the sole risk bearers of the executives' decisions. The non-executive directors can incorporate these factors by adapting the incentive intensity of executive compensation: the stronger a change in firm value is mirrored in a compensation change, the higher the pay-performance-sensitivity. We hence expect that a change in firm value is positively linked to the change in executive compensation and formulate our first hypothesis as follows:

H1: There is a positive relationship between the change in firm value and the change executive compensation.

5.2.2 Perceived dominance as a moderator

While the non-executives decide on the final compensation packages, the details of the compensation design result from negotiations between the non-executive directors and the individual executives. These negotiations include, for instance, the (minimum) targets to be achieved and the compensation levels associated with different degrees of target fulfillment. The principal-agent theory fails to adequately account for this practice. Executive compensation is subjected to a pay setting process which might be predisposed to exploitation of power and personal connections between executives and non-executives and, hence, instead of resolving the agency problem, might become a part of the problem itself. The managerial power hypothesis acknowledges this shortcoming and considers that the arm's length principle is likely infringed due to the ongoing interaction between executives and non-executive directors. It argues that executives hold power over non-executive directors, which they use to maximize their

own welfare from their compensation packages, i.e. they try to amplify their rent extraction. The latter is defined as earnings above what would be considered as efficient compensation granted under optimal contracting. Besides inefficiently high compensation, this also includes a weak pay-performance-sensitivity. Under the managerial power hypothesis, risk-averse executives will use their power to decouple firm value as a reflection of their own performance from their compensation, such that it reacts less sensibly to changes in firm value and insures executives against bad performance. (BEBCHUK/FRIED 2004; BEBCHUK/FRIED/WALKER 2002)

Literature considers several factors as enablers of misuse of managerial power, amongst which the ownership structure of a firm and the ratio of non-executive directors to executives (DALTON/DAILY/CERTO 2003; HAMBRICK/FINKELSTEIN 1995; VAN ESSEN/OTTEN/CARBERRY 2015). Executive power itself is commonly considered to increase with hard factors such as position experience (HILL/PHAN 1991; VAN ESSEN/OTTEN/CARBERRY 2015) or, in monistic systems, board duality for the CEO (VAN ESSEN/OTTEN/CARBERRY 2015). We propose that executive power might also increase with soft factors, particularly with perceived dominance.

Scholars like LORD (1985) and EPITROPAKI/MARTIN (2004) argue that people build their expectations of leadership based on socialization and experience, and that they attribute leadership to individuals matching these schemas (EPITROPAKI/MARTIN 2004; RUSH/RUSSELL 1988). Meta-analytic evidence found dominance to predict an engagement in leadership more than any other individual characteristic examined (LORD/DE VADER/ALLIGER 1986), consequently associating dominance with leadership qualification. Individuals that are perceived as highly dominant are connected with leadership qualities, such as forcefulness, assertiveness, self-assuredness (BUSS 1981; MANER/CASE 2016; WIGGINS 1979) and competence (ANDERSON/KILDUFF 2009). Perceived dominance is hence linked to qualities that are by socialization typically expected in a leader. Thus, limited information can already convey a sense of leadership fitness: an individual that is perceived as dominant fits the prototype of a leader.

Assessment of someone's leadership qualities can even be based – especially in case of information asymmetry or limited information availability – on mere physical cues (BLAKER et al. 2013; KOENIG et al. 2011), facial cues in particular playing an

important role in assessing and categorizing other individuals (TODOROV et al. 2015). Individuals possessing visible attributes that convey a sense of physical dominance are often preferred in leadership positions as they are considered more fit to represent and defend their own group's interests against outsiders (CHOI/BOWLES 2007). Moreover, research has found evidence for perceived leadership effectiveness in dominant individuals (DINH et al. 2014), which helps these individuals to gain monetary advantages (FRUHEN/WATKINS/JONES 2015).

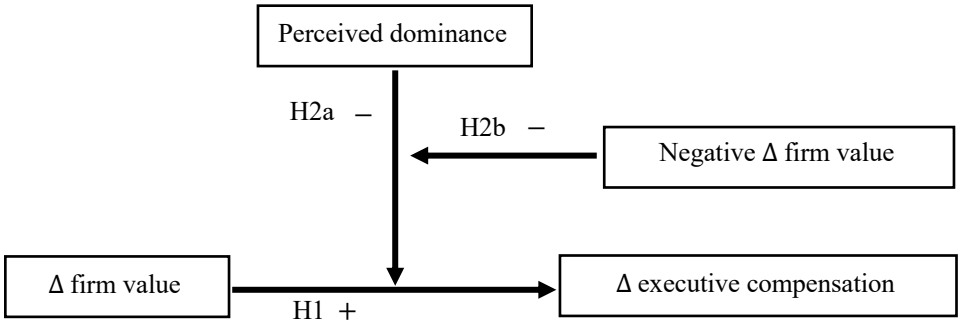
Hence, we reason that a visible display of dominance might bestow power to executives, in turn improving their standing in compensation negotiations with the non-executive directors for two reasons. First, executives that are perceived as dominant are categorized as good leaders. Similar to executive experience, this increases executive power, as they are considered to possess a desirable qualification that the non-executive directors want to retain in the firm. Being more permissive to the executives' demands on their compensation is a concession the non-executive directors can make. Second, dominance itself enhances managerial power since it is – as argued above – associated with characteristics such as assertiveness and forcefulness. Being perceived to possess these characteristics enhances an executive's capacity to exert his or her will (FINKELSTEIN 1992), putting the latter in a favorable bargaining position when it comes to compensation negotiations.

As argued by means of the managerial power hypothesis, risk-averse executives that are perceived as dominant have more power which they can use to augment their welfare in terms of pay by increasing their rent extraction (FRUHEN/WATKINS/JONES 2015). That is, they would want a positive change in firm value to be reflected as a result of their own good performance and to be compensated accordingly, while a decrease in firm value as a result of their bad performance should be punished as little as possible (BEBCHUK/FRIED 2004; BEBCHUK/FRIED/WALKER 2002). Accordingly, we formulate our hypotheses as follows and display the conceptual model in Figure 5.1:

H2a: The positive relationship between the change in firm value and the change in executive compensation is weakened by perceived dominance in such a way that the relationship is stronger for lower levels of perceived dominance and weaker for higher levels of perceived dominance.

H2b: The moderation postulated in H2a is stronger for negative changes in firm value and weaker for positive changes in firm value.

Figure 5.1: Graphical representation of the conceptual model



5.3 Data and method

5.3.1 Data and sample

We test our hypotheses on an unbalanced nested panel data set comprising 3,737 executive-year observations stemming from approximately 1,000 executives. The observations are from the period of 2006 to 2019 of firms listed in the two largest German indices, DAX and MDAX. German listed companies follow a dualistic system with strict separation of executive and non-executive directors into Executive Board and Supervisory Board.[11] This corporate governance system represents a stricter case of the arm's length approach, as the division into two boards leads to reduced interaction between executives and non-executive directors, the latter therefore being less exposed to potentially powerful executives. That is, executives might have less influence on non-executive directors (GÖX 2016), which enables us to confront our moderation hypotheses with data from a more challenging environment.

[11] For Societas Europaea (SE), a monistic system is also possible. However, only very few firms in Germany make use of this possibility.

For our analysis, we combine data from three different sources. Firstly, we use executive-firm-level data by (BECK/FRIEDL/SCHÄFER 2020), containing detailed compensation information as well as records on the executives' board entry, tenure, and departure. Further, we obtain firm-level performance and size information from Refinitiv/Eikon. Finally, we collect the data on executives' fWHR. To obtain the fWHR, we retrieve front view photographs on each executive from online sources, such as annual reports or media coverage.

5.3.2 Variables

Dependent variable

Our dependent variable is *Δ executive compensation*. This reflects the change in executive compensation from period t-1 to period t. To deal with outliers, the variable is winsorized at the 5th and 95th percentile. It includes the base salary, short- and long-term bonuses, stock and options grants as well as other compensation elements such as fringe benefits. Thus, our measure reflects an appropriate proxy for the total welfare of executives (BECK/FRIEDL/SCHÄFER 2020).

Explanatory variable

Our main explanatory variable is *Δ firm value*. Following previous research (GUAY/KEPLER/TSUI 2019; SCHULTZ/TIAN/TWITE 2013) we approximate *Δ firm value* by the change in market capitalization from period t-1 to period t. To deal with outliers, the variable is winsorized at the 5th and 95th percentile. We retrieve yearly data on market capitalization from Refinitiv/Eikon.

Moderating variable

Our moderator *dominance (std.)* is approximated by the fWHR (KAKKAR/SIVANATHAN/GOBEL 2020) and standardized for interpretability. The fWHR is defined as the ratio between the bizygomatic width and the upper-face height. The former yields the maximum horizontal distance from the left to the right facial boundaries, i.e. the extremities of the cheekbones, and the latter measures the vertical distance from the highest point of the upper lip to the mid-eyebrow. We draw back on Face++, an artificial intelligence, to obtain the facial measures. The artificial intelligence automatically sets markers to several relevant facial points, such as the the extremities of the upper and

lower lips or the cheekbones, and then gives us the distances between those markers, which we use to calculate the fWHR.

Control variables

We include *executive tenure* to account for executive power (HILL/PHAN 1991; VAN ESSEN/OTTEN/CARBERRY 2015), as well as the dummy *internal hire* (SCHNEIDER/ISEKE/PULL 2021), i.e. a variable that equals one if an executive has been working in the firm prior to being promoted to the Executive Board. The variables are calculated using the data set provided by BECK/FRIEDL/SCHÄFER (2020). Furthermore, we include *female executive* as a dummy to control for executives' gender. On the firm level, we control for *firm size* (ACABADO et al. 2020) measured as the natural logarithm of sales, and the *Supervisory Board size* as well as *free float*, the percentage of shares accessible to regular investors and not held by strategic investors, to account for monitoring strength. Both variables are retrieved from Refinitiv/Eikon.

5.3.3 Empirical strategy

In our main specification, we run a pooled OLS model with firm and year fixed effects. Firm fixed effects are included to absorb any firm-invariant factors, such as industry, that might affect executive compensation structures. Year fixed effects are included to account for any time-specific factors that could interfere with compensation packages, such as external shocks like the financial crisis. We include our set of control variables as described above and cluster standard errors at executive level to take into account repeated observations of the same individuals over time.

To test H1, we first regress *Δ executive compensation* on *Δ firm value* and the control variables, and then also include our moderator *dominance (std.)* to test H2a. Finally, we test H2b by splitting our sample into negative and positive values for *Δ firm value*. That is, we obtain regressions on one sub-sample including only observations of firms that experienced a drop in firm value, and one on a sub-sample including only observations of firms that experienced an increase in firm value.

5.4 Results

5.4.1 Descriptive statistics

Table 5.1 provides descriptive statistics on the variables used in our regression analysis. We observe sufficient variation in our variables, in particular also in *dominance*, hence making us less worried about a potential power problem. The correlation coefficients of the variables are displayed in Table 5.2. None of our variables correlate highly, hence not raising concern about potential collinearities. Figure 5.2 shows the distribution of the fWHR. While we cannot exclude that executives are, on average, rather at the upper bound of that measure in the overall population, the observations in our data set approximately follow a normal distribution.

Table 5.1: Summary statistics

Variables	Mean	SD	Min	Median	Max
Firm value	24,091.655	24,090.713	966.083	14,210.244	77,315.945
Executive compensation	2,298.323	1,307.628	356.000	2,104.820	5,013.141
Dominance	1.948	0.131	1.559	1.929	2.362
Internal hire	0.559	0.497	0	1	1
Executive tenure	6.429	4.831	0.515	5.032	46.275
Firm size	23.273	1.540	18.089	23.372	26.255
Supervisory Board size	15.433	4.781	3	16	26
Free float	73.488	22.474	23.000	80.000	100.000
Female executive	0.026	0.158	0	0	1

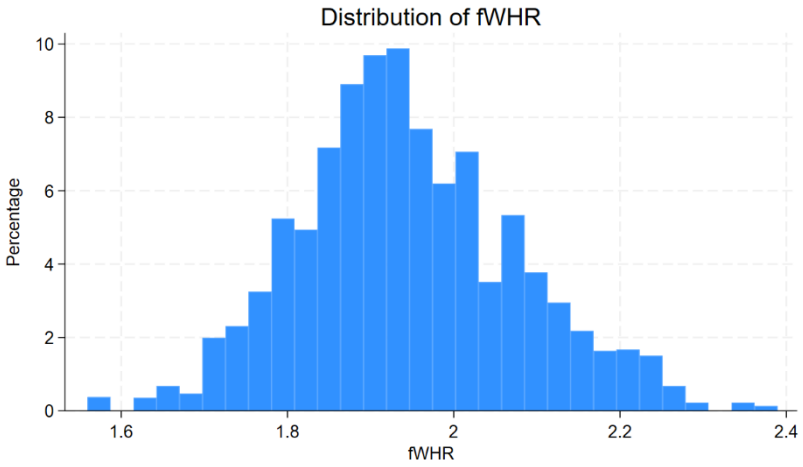
Notes: Firm value is indicated in millions, executive compensation in thousands and executive tenure in years. The values for dominance represent the non-standardized values.

Table 5.2: Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Firm value	-							
(2) Executive compensation	0.195***	-						
(3) Dominance	-0.00126	-0.0129	-					
(4) Internal hire	0.0427**	0.0307	0.0443**	-				
(5) Executive Tenure	-0.00156	-0.139***	0.0441**	0.0443**	-			
(6) Firm size	0.118***	0.00656	0.00530	0.0441**	-0.0676***	-		
(7) SupervisoryBoard size	0.0254	-0.00583	0.0313	0.00530	-0.0867***	0.546***	-	
(8) Free float	-0.00331	-0.00617	0.0466**	0.0313	-0.0360*	0.0265	-0.0699***	-
(9) Female executive	0.0406*	0.0129	-0.100***	0.0466**	-0.106***	0.0929***	0.0455**	-0.0226

N=3,737, *** p<0.01, ** p<0.05, * p<0.1

Figure 5.2: Distribution of fWHR



5.4.2 Main results

Table 5.3 reports the results of our regression analysis. First, in Model 1 and as expected, a change in firm value is significantly and positively associated with a change in executive compensation (β=0.026; p<0.01), reflecting the incentivizing mechanism of the compensation packages and supporting H1. A change in firm value by one unit (i.e. 1,000,000€) on average is associated with a change in executive compensation by 0.026 units in executive compensation, i.e. 26€. This is, albeit lower, comparable in terms of size to the pay-performance-sensitivity of 60-80€ found in German DAX companies, i.e. the largest companies in our sample, for the period of 1985 to 2015 (GÖX 2016). Second, we find an insignificant negative moderation for *dominance* (β=–0.004; n.s.) in Model 2, thus not supporting H2a. When splitting our sample in positive and negative changes of firm value in Models 3 and 4 respectively, we find some support for H2b, indicating a weaker pay-performance-sensitivity for executives with higher perceived dominance for negative changes in firm value (β=–0.010; p<0.1) but not for positive changes in firm value (β=–0.003; n.s.). Thus, executive compensation reacts less sensibly to changes in firm value and becomes less contingent on their performance, mainly when the changes in firm value are negative, but not when changes in firm value are positive.

Table 5.3: Main results

Dependent variable=	Δ executive compensation			
	(1)	(2)	(3)	(4)
			Δ Firm value >0	Δ Firm value <0
Explanatory variables				
Δ Firm value	0.026***	0.026***	0.024***	0.025**
	(0.004)	(0.004)	(0.007)	(0.011)
Dominance (std.)		-2.246	-2.813	-36.510
		(11.077)	(20.620)	(22.630)
Δ Firm value * Dominance (std.)		-0.004	-0.003	-0.010*
		(0.003)	(0.004)	(0.006)
Control variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	3,737	3,737	2,185	1,519
R-squared	0.119	0.120	0.172	0.218

Standard errors clustered at executive level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Constant not displayed.

5.4.3 Robustness checks

To check the robustness of our main findings, we re-run our regression with different specifications. Table 5.4 presents the results with an alternative specification of our dependent variable. Since executive compensation packages are often not contingent on absolute performance, but on performance relative to the firm's peers, we exchange the dependent variable in Models 5 and 6 such that the change in firm value is not compared to zero, but to the market average. The market average is measured as the mean of change in *Δ firm value* by industry. Even though the sub-sample sizes change compared to our main model in Table 5.3, the results in Table 5.4 are highly similar in terms of coefficient sizes, directions and significance level. Hence, we understand this as further supporting evidence for H1 and H2b.

Table 5.4: Alternative specification of the dependent variable

Dependent variable=	Δ executive compensation			
	(1)	(2)	(5) Δ Firm value > market average	(6) Δ Firm value < market average
Explanatory variables				
Δ Firm value	0.026***	0.026***	0.021***	0.022**
	(0.004)	(0.004)	(0.008)	(0.010)
Dominance (std.)		-2.246	-15.756	-14.534
		(11.077)	(21.502)	(15.440)
Δ Firm value * Dominance (std.)		-0.004	-0.002	-0.009*
		(0.003)	(0.004)	(0.004)
Control variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	3,737	3,737	1,605	2,132
R-squared	0.119	0.120	0.193	0.198

Standard errors clustered at executive level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Constant not displayed.

Table 5.5 displays our main regression model, but with industry fixed effects. Firm fixed effects, as used in our main specification, are sometimes rather restrictive because of the many firm-specific factors they absorb. Therefore, we exchange the firm fixed effects for industry fixed effects in Table 5.5. This accounts for industry-invariant factors, such as executive compensation regulations within industries. These regulations might, however, vary between industries – for instance, the financial sector being more heavily regulated. As expected, this specification reduces the amount of variability explained in Models 7 to 10, i.e. R^2 decreases compared to Models 1 to 4 (Table 5.3). Still, our results remain unchanged in all models.

Table 5.5: Industry fixed effects

Dependent variable=	Δ executive compensation			
	(7)	(8)	(9)	(10)
			Δ Firm value > 0	Δ Firm value < 0
Explanatory variables				
Δ Firm value	0.026***	0.026***	0.016***	0.020**
	(0.003)	(0.003)	(0.005)	(0.009)
Dominance (std.)		-0.832	-0.186	-27.608
		(11.246)	(22.173)	(22.137)
Δ Firm value * Dominance (std.)		-0.004	-0.004	-0.010*
		(0.003)	(0.004)	(0.006)
Control variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	3,592	3,592	2,090	1,469
R-squared	0.092	0.093	0.098	0.099

Standard errors clustered at executive level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Constant not displayed.

Table 5.6 shows the results of our main regression model, but with the interacted fixed effects of industry and year. This controls for factors that are constant within a given year in a given industry and might affect executive compensation packages. For instance, it absorbs industry shocks such as the one caused by the Volkswagen emission scandal in 2015, which affected the entire automotive industry. This interacted fixed effects is rather restrictive, but increases the R^2 in Models 11 to 14. Yet again, no changes are observed in the models with the full sample (Models 11 and 12). There is, though, a slight decrease in coefficient sizes of the direct effect of *Δ firm value* in Models 13 and 14, and a decrease in its significance in Model 14. However, the moderating effect of *dominance (std)* remains robust in terms of direction, size and significance in Model 14. Overall, we are thus confident that these findings corroborate the supporting evidence on H1 and the supporting evidence on H2b that we found in our main specification.

Table 5.6: Interacted industry and year fixed effects

Dependent variable=	Δ executive compensation			
	(11)	(12)	(13)	(14)
			Δ Firm value > 0	Δ Firm value < 0
Explanatory variables				
Δ Firm value	0.024***	0.024***	0.015**	0.016*
	(0.003)	(0.003)	(0.006)	(0.009)
Dominance (std.)		-2.497	7.935	-33.523
		(11.440)	(22.879)	(23.693)
Δ Firm value * Dominance (std.)		-0.004	-0.005	-0.009*
		(0.003)	(0.004)	(0.005)
Control variables	Yes	Yes	Yes	Yes
Industry * Year FE	Yes	Yes	Yes	Yes
Observations	3,592	3,592	2,090	1,469
R-squared	0.201	0.202	0.232	0.266

Standard errors clustered at executive level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Constant not displayed.

5.4.4 Visualization of the moderation effect

In accordance with recent guidelines for reporting interaction effects, we follow best practices for moderation analysis by presenting simple slopes (MURPHY/AGUINIS 2022). For better comparability and to avoid excessive truncation, we present the mean change in executive compensation as a range, including one standard deviation above and below the mean. On the x-axis, we display the whole range of possible changes in firm value. Consistent with our regression models, the sample is divided into two sub-samples: one reflecting a negative change in firm value – ranging from the highest negative change in firm value to zero (Figure 5.3) – and the other a positive change in firm value – ranging from zero to the highest positive change in firm value (Figure 5.4).

Figure 5.3 illustrates the effect of a negative change in firm value on the change in executives' compensation, with *dominance* as the moderating variable. Specifically, we compare executives with high values for *dominance* (one standard deviation above the mean) to those with low values for *dominance* (one standard deviation below the mean).

Figure 5.3: Moderation effect with negative change in firm value (relative to 0)

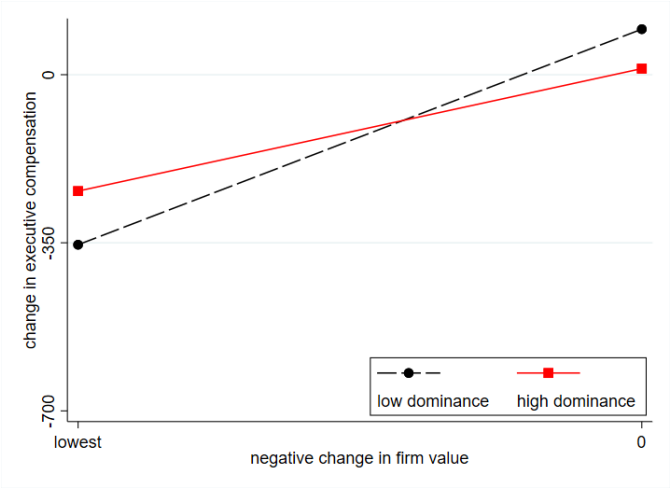
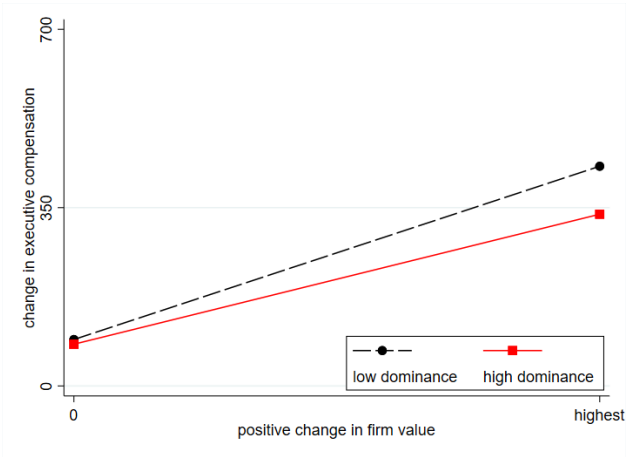


Figure 5.4: Moderation effect with positive change in firm value (relative to 0)



The graphical depiction aligns with the regression results, indicating that the relationship between a negative change in firm value and the change in executives' compensation is weaker for executives with high *dominance* values, as evidenced by the flatter slope. Conversely, for executives with lower *dominance* values, the relationship is stronger, represented by a steeper slope. Additionally, the decline in compensation is less severe for executives with high *dominance* values when the change in firm value decreases, as indicated by the red curve generally positioned above the blue and dotted curves. For a positive change in firm value (Figure 5.4), we do not find a significant moderating effect of *dominance* on the link between a change in firm value and a

change in executive compensation. Albeit graphically the curves are not perfectly parallel (which they should be for a zero level moderation), we find the slopes of the curves to be closer to one another.

As a robustness check reflecting the regressions in Table 5.4, we split the sample not by positive or negative changes in firm value, but by whether the change was below or above the yearly industry average (see Figures 5.5 and 5.6). This accounts for general time trends and reflects an appropriate robustness check, as executive compensation is often based on relative performance comparisons. The results reveal patterns similar to those observed when we split the sample by positive or negative changes in firm value, underscoring the robustness of our empirical findings. Notably, when the change in firm value is below the yearly average, the link between firm value changes and changes in executive compensation is noticeably weaker for perceived dominant executives, and their compensation more consistently remains above that of perceived less dominant executives.

Overall, our graphical representations support our theoretical arguments that executives with high perceived dominance have a weaker pay-performance-sensitivity, driven by negative changes in firm value. Specifically, executives with high perceived dominance seem to be able to decouple their compensation from firm performance when the firm is underperforming (negative changes or below the yearly industry average), but maintain stronger pay-performance-sensitivity when the firm performs well (positive changes or above the yearly industry average).

Figure 5.5: Moderation effect with negative change in firm value (relative to market average)

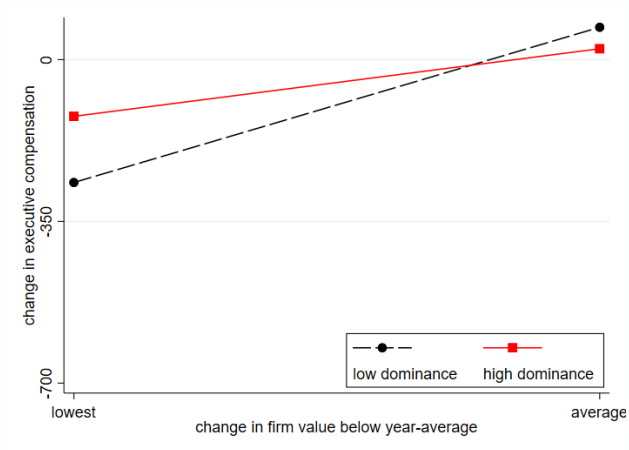
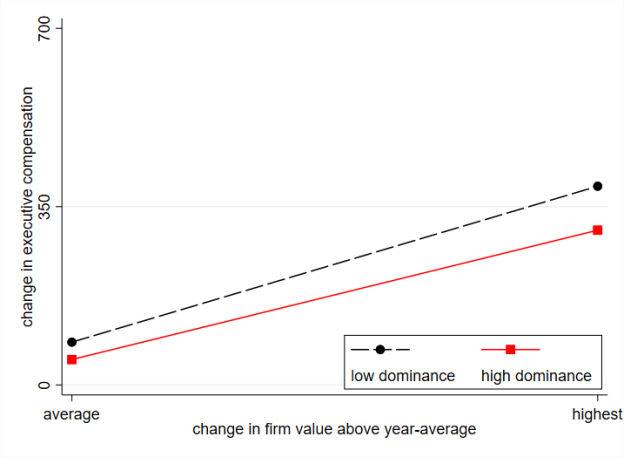


Figure 5.6: Moderation effect with positive change in firm value (relative to market average)



5.5 Discussion

Based on our analysis, we find tentative supporting empirical evidence that perceived dominance reduces the pay-performance-sensitivity in executives' compensation in the case of underperforming firms. With this finding, we contribute to literature in two ways. First, we add a new perspective to the ongoing dispute between advocates of the optimal contracting view and the managerial power hypothesis. Perceived dominance, which is approximated by fWHR and arguably conveys power, might help executives reduce the pay-performance-sensitivity in their favor and hamper with optimal incentivizing and hence sets a boundary condition to the optimal contracting view. That is, perceived dominant executives are penalized less severely in case of bad performance. Our findings are relevant to understanding the dynamics at play when compensation packages are arranged, because they interfere with an appropriate alignment of interests between executives and shareholders. The non-executive directors in charge of designing and negotiating compensation packages should be aware of this subconscious bias to counteract further reduction of incentive intensities at the expense of the shareholders.

Second, we contribute to the literature on the managerial power hypothesis by introducing a new, more subtle source of managerial power. We revert to the fWHR as a measure of perceived dominance which is well established in the psychological literature and transfer it to the business context. So far, managerial power has been measured in terms of hard factors, e.g. executive tenure or board duality, and while

these are highly relevant and have been exhaustively analyzed and used in literature, we hope to broaden the perspective on the concept of power. Even though we capture perceived dominance with the presumably objective measure of the fWHR, the underlying process we suspect is rather subconscious and not based on relational and professional experience, as is the case for the traditional measures. For instance, executives with high tenure likely have longer professional relations with the non-executive directors and have accumulated firm-specific knowledge, which they can use as an argument in compensation negotiations to pressure non-executives to indulge to their demands. Conversely, executives that are perceived as dominant by the non-executive directors are, according to prior literature, ascribed competence and leadership skills even in absence of actual display of the latter (EPITROPAKI/MARTIN 2004; LORD/DE VADER/ALLIGER 1986; RUSH/RUSSELL 1988). Based on our findings we argue that this subconscious perception might improve the executives' basis for negotiation. Future research could therefore follow this more psychological perspective and explore additional 'soft' factors that are not rooted in (relational) experience, but rather in appearances or perceived personality traits.

Our study does not come without weaknesses. First, while we are confident that our measure of executive compensation reflects the consequences of changes in market value in interaction with various levels of perceived dominance in a meaningful way, our measure does not capture the full extent of performance benefits for executives. As we do not include data, for instance, on executive stock ownership levels (JENSEN/MURPHY 1990), our estimated pay-performance-sensitivity should be viewed as an assessed lower bound of the relationship. This would arguably speak in favor of a stronger effect than the one we found. Future research could look into this more complete measurement of executive wealth to uncover the full extent of the implications of perceived dominance. This might be especially relevant in countries like the United States, where executives have quite substantial stock option plans, as compared to Germany (MURPHY 2013).

Second, while we empirically observe that efficient pay setting according to optimal contracting is undermined by non-performance related factors, we can only speculate on the underlying processes. While we argue that a high fWHR is associated with

a *perception* of higher dominance, some studies suggest that fWHR might be associated with the actual personality trait of dominance (e.g. ANDERL et al. 2016; CARRÉ/MCCORMICK 2008; CARRÉ/MCCORMICK/MONDLOCH 2009; GENIOLE et al. 2015; HASELHUHN et al. 2014). In that case, our findings might not reflect a subconscious bias of non-executive directors but rather assess a higher negotiation power due to executives' *behavioral* dominance. Therefore, laboratory experiments or qualitative research might help to understand the mechanisms at play.

Third, our findings are based on German data, which is embedded in a predominantly dualistic board system. Compared to a monistic governance system, there is more limited contact and interaction between the executives and the Supervisory Board's directors. On the one hand, this might cause our findings to be rather on the lower bound of the actual effect, because non-executive directors are less frequently exposed to executives' conveyance of dominance. On the other hand, non-executive directors have less relational experience with the executives to revert to than in a monistic setting. Correspondingly, in a one-tier system, non-executives with high relational experience might be better able to assess the executives' actual traits and be less disposed to be subconsciously influenced by dominant appearances. In that case, our findings would overestimate the importance of perceived dominance as a moderating factor. That is, our findings cannot be generalized to the context of a monistic governance system. Future research should therefore investigate this alternative setting.

Despite its limitations, our study offers an intriguing new way to look at managerial power by bridging insights from psychological and business literature. With perceived executive dominance as a more subtle factor influencing pay-performance-sensitivity, we offer a novel perspective on the complexity of managerial power and emphasize the importance of considering potential psychological biases in compensation design, opening the door for future interdisciplinary research. With greater awareness of the dynamics at play, firms could target problematic governance practices to ensure more equitable pay and a better alignment of executive and shareholder interests.

6. Conclusion

Facing the versatile demands of today's corporate world, firms are held accountable to an ethical standard exceeding that of mere financial profitability (AGUILERA et al. 2006, 2021; WALLS/BERRONE/PHAN 2012). The board of directors in its role as a firm's strategist has to evaluate and carefully navigate this challenging landscape. While international organizations like the United Nations or the European Union, as well as national politics can guide boards with general rules to find their way (EUROPEAN UNION 2017; REGIERUNGSKOMMISSION GCGC 2022; UNITED NATIONS DEVELOPMENT PROGRAMME 2023), the eventual success ultimately depends on the boards' skillset. In that matter, the board of directors, which should guide the firm to corporate success, is like the captain of a ship entrusted with the task to safely bring it to the port. Like the captain keeping an eye on the sea swell and adapting the course by setting the sails according to the weather to use the winds, the board needs to keep an eye on evolving societal and legal expectations to adapt the firm strategy by setting matching goals. Like a captain to his crew, the board needs to give commands and instructions to the executives to steer the ship in the right direction. A captain need not neglect, though, that he is not only responsible for the ship, but that he is also in charge of his crew's well-being and work efficiency and must thus treat his crew fairly, but determinedly, so they perform their best to quickly and safely steer the ship to its port.

Given the vast number of subjects that are gathered under the umbrella-term of ESG, this doctoral thesis indeed only tackled very selected topics relating to corporate boards and sustainability. Nevertheless, it (un-)covered how differences between individuals can help directors in a board succeed in their joint effort to reach the port – but also where they might still have blind spots in their commanding. Chapters 2 and 3 were dedicated to showing that differences amongst directors in (gender) diverse boards can – under certain conditions – be beneficial to firms in improving their *environmental* and *social* performance. Chapters 4 and 5 were dedicated to unveiling the downturn of apparent differences in executives, in that they hamper with good *governance* practices by undermining fair and sustainable executive payment systems.

Chapter 2 analyzed the unintended yet valuable implications of board gender balancing reforms in promoting the environmental and social performance of smaller versus larger European firms. Based on a staggered DiD approach, we found no causal

evidence for a direct impact of board gender diversity on the performance. However, we found robust evidence in line with previous research that larger firms perform better environmentally and socially (ACABADO et al. 2020; DREMPETIC/KLEIN/ZWERGEL 2020). Further investigations uncovered their higher visibility to be a driving factor behind these findings. Moreover, we showed that smaller firms, nonetheless, do reap the benefits of higher board gender diversity, as they catch up with their larger peers' environmental and social performance following the implementation of gender balancing reforms. We empirically identified their lower complexity as a key driver of this effect. Overall, the study emphasizes the relevance of corporate context in policy making, as different conditions may yield very distinct results.

Chapter 3 studied the connection between board diversity, – measured across age, gender, and nationality – board size and environmental and social outcomes and produces two main empirical findings. First, and in line with previous research (BEJI et al. 2021; CHEN et al. 2024; HAFSI/TURGUT 2013; HARJOTO/LAKSMANA/LEE 2015), I find that firms with highly diverse boards perform better environmentally and socially. I extend previous research by highlighting board size as a moderator in this relationship, shifting its understanding to a contextual variable that further promotes the positive implications of board diversity. Second, the paper explored nuanced aspects of environmental and social performance across seven sub-categories of environmental and social performance. While the direction and significance levels of the direct effects of board diversity and moderating effect of board size remained consistent across the sub-categories, the economic relevance varied. This accentuates that there still are undiscovered mechanisms at play. In sum, chapters 2 and 3 contribute to the growing body of research on the role of corporate boards for sustainable firm outcomes (AGUILERA et al. 2021; BEAR/RAHMAN/POST 2010; BEJI et al. 2021; POST/RAHMAN/MCQUILLEN 2015; POST/RAHMAN/RUBOW 2011).

Chapter 4, which can be framed as an example of failing governance practices, looked at the gender pay gap at the executive level. That is, while directors should design executive pay in a way that objectively reflects executive qualification and performance, we argued that unconscious stereotyping impedes this. Apart from the descriptive insight that executive functions are stereotyped as more or less masculine, as proposed by REICHEL/SCHEIBMAYR/BRANDL (2020), two inferential findings arose

from the study. For one, we found supporting evidence for a pay premium for executive functions perceived as more masculine. This adds to previous literature on pay differences between executive functions (CARPENTER/WADE 2002; DEZSŐ/LI/ROSS 2022) and on the persistence of gender stereotypes on executive level, showing that masculinity is closely aligned with status (MARKÓCZY/SUN/ZHU 2021), which comes along with higher pay. For another, female executives in masculine-stereotyped functions face a pay penalty, reflecting role incongruity for women in such functions. These results are help explaining why the gender pay gap prevails even at the highly visible executive level, despite the increasing effort for governance mechanisms combatting unequal treatment of men and women in the corporate world.

Chapter 5 shows another example of how failing governance structures can lead to inefficient executive pay packages and unequal treatment of executives. Under efficient governance, directors should design executive pay such that changes in firm value are closely connected to changes in executive pay to penalize or reward executives based on their performance (EDMANS/GABAIX 2009; HOLMSTROM 1979). The study, however, has one novel finding hinting at unequal treatment of executives, such that they have preferential outcomes when they have high levels of perceived dominance. By means of the fWHR as a validated measure of perceived dominance (KAKKAR/SIVANATHAN/GOBEL 2020), we showed that high perceived dominance interferes with the pay-performance-sensitivity. This result was robust amongst several specifications and indicates that – in case of bad firm performance – executives with higher perceived dominance are not penalized as much for their low accomplishments as their less dominant colleagues. Chapters 4 and 5 contribute to the literature on the remaining unexplained pay (scheme) differences amongst executives by proposing two visible and non-performance-related factors as potential explanations to the puzzle (e.g. EDMANS/GABAIX 2009; HANDSCHUMACHER-KNORS 2023; REBÉRIOUX/ROUDAUT 2019).

Each study in this cumulative doctoral thesis presented its own implications, but some general propositions for different actors can be derived as well. First, all findings highlight how important it is that firms reflect on their corporate governance and board functioning to optimally implement necessary changes in their pursuit of better ESG performance. We showed that factors such as board size and composition matter and

substantially contribute to or interfere with ESG outcomes, stressing how important it is that responsibilities and duties are consigned to the right (amount) of people. The best crew with an incompetent captain can only do so much.

This leads to the second point: the importance of external regulation or guidance by policy makers and organizations to correct inefficient corporate governance structures and governance practices. The implementation of gender quotas in several European countries certainly accelerated the increase in female representation on the highest corporate levels and thereby, as we demonstrated, the improvement in some firms' ESG performance. But also other legislation, such as the Amendment to the Shareholders' Rights Directive put into practice in 2020 (EUROPEAN UNION 2017), might help to reallocate rights such that harmful governance practices can be counteracted. For instance, the latter's "Say on Pay" clause assigns new power to shareholders, which can now take better action against unsustainable executive pay practices. That is, unconsciously biased directors or unequal treatment of executives could be attenuated. However, this also comes along with a need for caution. Because pre-existing factors such as firm or board size matter, as indicated in the first point, recommendations formulated by policy makers and organizations need to account for the fact that the principle of "one size fits all" does not apply. Therefore, they need to be nuanced in their guidance. A ship that is slowly drifting off course could need a fix of its steering wheel such that the captain can correct the course. However, if the steering wheel never was the issue, but rather a leak in the ship, fixing the steering wheel while ignoring the leak might aggravate the problem.

Finally, this thesis demonstrates the need for directors to be (made) aware of (their) apparent differences in order to either intentionally exploit the strengths found in the combination of different skillsets and viewpoints, or to avoid potential unconscious biases that might lead to bad governance practices. Assuming that they indeed want to act in the best interest of the firm and its stakeholders, comprehending their shortcomings helps them reduce the likelihood of unintentionally causing harm. One way in which firms could prevent human fallacies might be by offering the necessary sensitivity training in onboarding – for even a qualified captain can wreck a ship in misjudgment of a situation.

Even though this doctoral thesis exposes important implications for the role of corporate governance, boards and ESG performance, it also has several general limitations. To start, all the studies were conducted exclusively on European data. This limits the generalizability of the findings, as corporate governance and governmental interventions are traditionally regulated very differently across the globe. For instance, the Chinese market heavily builds on state-owned enterprises. On the one hand, Chinese firms face other corporate governance issues than European firms, e.g. the rather inefficient politically driven appointments of boards and executives (LIN et al. 2020). On the other hand, their collectivistic culture puts different emphasis on firms' goals, e.g. putting social goals first rather than financial ones (LIN et al. 2020). Moreover, cultural differences can also impact generalizability. While European countries, for example, culturally appreciate and promote (gender) diversity, this is not necessarily the case for other cultures. As shown by previous literature, the dissimilar valuation of diversity leads to diverging financial outcomes across countries (ZHANG 2020), such that it seems probable that this also applies to ESG outcomes. Hence, in a politically, economically and culturally different landscape, our findings will likely not hold and the implications not apply. A ship in a desert will be useless.

Following the same line of thought, the use of data samples compiled of firms across Europe might also come with its downsides. Apart from chapter 5, which relies on German observations exclusively, the studies rely on international firms located in several countries. While a substantial part of the corporate landscape is regulated by Europe-wide agreements, there are still notable political, economic and traditional differences between the countries – and a captain of a sailing ship is not necessarily adept to command a cruise ship. As discussed in chapter 4, for instance, countries follow different corporate governance structures in terms of one-tier, two-tier or mixed systems. Although robustness checks and country fixed effects can mitigate some of the concerns, the occurrence of an omitted variable bias cannot be excluded.

One limitation rooted in the empirical approach is the nature of the findings. Due to the employed methods, the studies only establish correlational evidence. Solely chapter 2, which took advantage of gender balancing reforms as a set-up for a natural experiment to apply a staggered DiD model, can claim somewhat causal interpretability for the results.

Additionally, the present studies empirically establish the extent to which ESG goals are achieved or structures take effect but only theorizes on the mechanisms. Hence, this thesis only shows *that* there is a connection between boards and ESG performance, *that* governance fails in terms of inefficient executive pay, but falls short in the provision of evidence for the reasons *why* that is the case. That is, we only argued what mechanisms – rooted in theory and based on previous empirics – might explain our results but cannot exclude that entirely different reasons for our results. A shipwreck can be found, but without reports or the ship's black box, it might be hard to understand the reason for its sinking.

These limitations provide some directives for future research. First, more extensive research is needed on the relevant organs of corporate governance, and the context in which they operate to make firms' ESG performance thrive. Especially uncovering unintentionally beneficial or detrimental contexts, i.e. firm size or countries, or mechanisms, i.e. stereotypes or biases, could provide guidance to policy makers in designing regulations and firms in adopting structures or practices that set the sails to optimally catch the wind.

Second, more research should peek behind the scenes to uncover whether mechanisms postulated in theory are actually at play. Of course, it is hardly possible for researchers to attend board meetings to observe the dynamics between diverse board members or to take part in pay negotiations between boards and executives. For one, laboratory experiments could be used to imitate similar conditions to observe human behavior. For instance, pay negotiations could be enacted and factors like gender or facial dominance manipulated through different participants. While such experiments undeniably come along with issues of external validity, the highly controlled environment though allows for more causal inference. Another remedy to uncovering the mechanisms could be found in qualitative research. Getting access to an entire board of directors is undoubtedly an ambitious endeavor, but getting access to single directors might be more practicable. Qualitative research methods like interviews could prove useful in understanding internal board dynamics. Comprehending whether the ship has a broken steering wheel, or a leak helps to see what actions are necessary to get back on course.

Third, ESG outcomes need to be scrutinized in more detail both empirically and theoretically. As touched on in chapter 3, the extent to which boards can shape environmental and social outcomes might be driven by particular aspects. All the theories consulted in chapters 2 and 3, i.e. agency theory, resource dependence theory, upper-echelons theory, resource-based view and stakeholder theory, have the mutual shortcoming that they only generally and vaguely explain why different actors promote ESG outcomes. For instance, women are considered as more attuned to social issues due to their socialization and communal traits (KASSINIS et al. 2016; KHAN/KHAN/BIN SAEED 2019). However, none of the listed theories provide more nuance regarding the stakeholders or issues they might be especially considerate of. While they could be particularly aware of social issues like human rights, it does not mean that they are equally concerned about the workforce or customers. Unravelling the nuances from a theoretical perspective could help in understanding and further disentangling the discrepancies in the more subtle results. This would be particularly useful in advising firms that want to address concrete issues. In that way, by understanding the dynamics and structures needed, performance issues could be tackled in a more targeted manner.

References

Acabado, Daniela R.; Ana S. Branca; Margarida Catalão-Lopes; Joaquim P. Pina (2020): Do Distinct CSR Categories Have Distinct Determinants? The Roles of Market Structure and Firm Size. *European Management Review* 17(2020)1: 5–17.

Acemoglu, Daron; David H. Autor; David Lyle (2004): Women, War, and Wages: The Effect of Female Labor Supply on the Wage Structure at Midcentury. *Journal of Political Economy* 112(2004)3: 497–551.

Adams, Renée B. (2016): Women on Boards: The Superheroes of Tomorrow? *The Leadership Quarterly* 27(2016)3: 371–386.

Adams, Renée B.; Daniel Ferreira (2009): Women in the Boardroom and Their Impact on Governance and Performance. *Journal of Financial Economics* 94(2009)2: 291–309.

Adnan, Atm; Hilda Tandigalla (2017): The Dramatic Shift in Emphasis from a Shareholder-Dominated Approach to a Stakeholder-Oriented Corporate Governance Model. *European Journal of Business and Economics* 12(2017)2: 11151.

Adomako, Samuel; Mujtaba Ahsan (2022): Entrepreneurial Passion and SMEs' Performance: Moderating Effects of Financial Resource Availability and Resource Flexibility. *Journal of Business Research* 144(2022): 122–135.

Adomako, Samuel; Nguyen P. Nguyen (2020): Human Resource Slack, Sustainable Innovation, and Environmental Performance of Small and Medium-sized Enterprises in sub-Saharan Africa. *Business Strategy and the Environment* 29(2020)8: 2984–2994.

Aguilera, Ruth V.; J. Alberto Aragón-Correa; Valentina Marano; Peter A. Tashman (2021): The Corporate Governance of Environmental Sustainability: A Review and Proposal for More Integrated Research. *Journal of Management* 47(2021)6: 1468–1497.

Aguilera, Ruth V.; Gregory Jackson (2003). The Cross-National Diversity of Corporate Governance: Dimensions and Determinants. *Academy of Management Review* 258(2003)3: 447–465.

Aguilera, Ruth V.; Gregory Jackson (2010): Comparative and International Corporate Governance. *Academy of Management Annals* 4(2003)1: 485–556.

Aguilera, Ruth V.; Cynthia A. Williams; John M. Conley; Deborah E. Rupp (2006): Corporate Governance and Social Responsibility: A Comparative Analysis of the UK and the US. *Corporate Governance: An International Review* 14(2006)3: 147–158.

Agut, Sonia; Carlos H. Blasi; Daniel Pinazo (2022): Agentic Traits, Even When Perceived as Low Value, Still Hold Sway in Management. *Journal of Gender Studies* 31(2022)3: 351–363.

Ahern, Kenneth R.; Amy K. Dittmar (2012): The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation. *The Quarterly Journal of Economics* 127(2012)1: 137–197.

Albanesi, Stefania; Claudia Olivetti; María J. Prados (2015): Gender and Dynamic Agency: Theory and Evidence on the Compensation of Top Executives. *Gender in the Labor Market* 42(2015):1–59.

Alkadry, Mohamad G.; and Leslie E. Tower (2011): Covert Pay Discrimination: How Authority Predicts Pay Differences between Women and Men. *Public Administration Review* 71(2011)5: 740–750.

Al-Shaer, Habiba; Mahbub Zaman (2019): CEO Compensation and Sustainability Reporting Assurance: Evidence from the UK. *Journal of Business Ethics* 158(2019)1: 233–252.

Aluchna, Maria (2023): One-Tier Board. In: Idowu, Samuel O.; René Schmidpeter, Nicolas Capaldi; Liangrong Zu; Mara Del Baldo; Rute Abreu (Eds.): Encyclopedia of Sustainable Management. Cham: Springer: 2500–2508.

Anderl, Christine; Tim Hahn; Ann-Kathrin Schmidt; Heike Moldenhauer; Karolien Notebaert; Celina C. Clément; Sabine Windmann (2016): Facial Width-to-Height Ratio Predicts Psychopathic Traits in Males. *Personality and Individual Differences* 88(2016): 99–101.

Anderson, Cameron; Gavin J. Kilduff (2009): Why Do Dominant Personalities Attain Influence in Face-to-Face Groups? The Competence-Signaling Effects of Trait Dominance. *Journal of Personality and Social Psychology* 96(2009)2: 491–503.

Antonakis, John (2017): On Doing Better Science: From Thrill of Discovery to Policy Implications. *The Leadership Quarterly* 28(2017)1: 5–21.

Antonakis, John; Samuel Bendahan; Philippe Jacquart; Rafael Lalive (2010): On Making Causal Claims: A Review and Recommendations. *The Leadership Quarterly* 21(2010)6: 1086–1120.

Aouadi, Amal; Sylvain Marsat (2018): Do ESG Controversies Matter for Firm Value? Evidence from International Data. *Journal of Business Ethics* 151(2018)4: 1027–1047.

Apesteguia, Jose; Ghazala Azmat; Nagore Iriberri (2012): The Impact of Gender Composition on Team Performance and Decision Making: Evidence from the Field. *Management Science* 58(2012)1: 78–93.

Aragón-Correa, Alberto J.; Sanjay Sharma (2003): A Contingent Resource-Based View of Proactive Corporate Environmental Strategy. *Academy of Management Review* 28(2003)1: 71–88.

Arayakarnkul, Pochara; Pattanaporn Chatjuthamard; Sirimon Treepongkaruna (2022): Board Gender Diversity, Corporate Social Commitment and Sustainability. *Corporate Social Responsibility and Environmental Management* 29(2022)5: 1706–1721.

Arnold, Christian; Julia Herzberg; Ricarda Zeh (2021): Vorstandsvergütung Und Nachhaltigkeit. *Die Aktiengesellschaft* 66(2021)4: 141–147.

Ashforth, Blake E.; Fred Mael (1989): Social Identity Theory and the Organization. *Academy of Management Review* 14(1989)1: 20-39.

Athey, Susan; Guido W. Imbens (2022): Design-Based Analysis in Difference-In-Differences Settings with Staggered Adoption. *Journal of Econometrics* 226(2022)1: 62–79.

Bae, Sung J.; Sangyun Han (2019): The Impact of R&D Workforce Diversity on Firm's Performance in Internal and External R&D. *European Journal of Innovation Management* 23(2019)3: 454–473.

Baker, Andrew C.; David F. Larcker; Charles C. Y. Wang (2022): How Much Should We Trust Staggered Difference-in-Differences Estimates? *Journal of Financial Economics* 144(2022)2: 370–395.

Baldini, Maria; Lorenzo Dal Maso; Giovanni Liberatore; Francesco Mazzi; Simone Terzani (2018): Role of Country- and Firm-Level Determinants in Environmental, Social, and Governance Disclosure. *Journal of Business Ethics* 150(2018)1: 79–98.

Bansal, Pratima; Iain Clelland (2004): Talking Trash: Legitimacy, Impression Management, and Unsystematic Risk in the Context of the Natural Environment. *Academy of Management Journal* 47(2004)1: 93–103.

Barbulescu, Roxana; Matthew Bidwell (2013): Do Women Choose Different Jobs from Men? Mechanisms of Application Segregation in the Market for Managerial Workers. *Organization Science* 24(2013)3: 737–756.

Barney, Jay B. (1991): Firm Resources and Sustained Competitive Advantage. *Journal of Management* 17(1991)1: 99–120.

Barney, Jay B. (2018): Why Resource-based Theory's Model of Profit Appropriation Must Incorporate a Stakeholder Perspective. *Strategic Management Journal* 39(2018)13: 3305–3325.

Barney, Jay B.; David J. Ketchen; Mike Wright (2021): Bold Voices and New Opportunities: An Expanded Research Agenda for the Resource-Based View. *Journal of Management* 47(2021)7: 1677–83.

Beamish, Paul W.; Dwarka Chakravarty (2021): Using the Resource-Based View in Multinational Enterprise Research. *Journal of Management* 47(2021)7: 1861–1877.

Bear, Stephen; Noushi Rahman; Corinne Post (2010): The Impact of Board Diversity and Gender Composition on Corporate Social Responsibility and Firm Reputation. *Journal of Business Ethics* 97(2010): 207–221.

Bebchuk, Lucian A.; Jesse M. Fried (2006): Pay without Performance: Overview of the Issues. *Academy of Management Perspectives* 20(2006)1: 5–24.

Bebchuk, Lucian A.; Jesse M. Fried (2004): *Pay without Performance, The Unfulfilled Promise of Executive Compensation*. Cambridge: Harvard University Press.

Bebchuk, Lucian A.; Jesse M. Fried; David I. Walker (2002): Managerial Power and Rent Extraction in the Design of Executive Compensation. *The University of Chicago Law Review* 69(2002)3: 751–846.

Beck, Daniel; Gunther Friedl; Peter Schäfer (2020): Executive Compensation in Germany. *Journal of Business Economics* 90(2020): 787–824.

Beji, Rania; Ouidad Yousfi; Nadia Loukil; Abdelwahed Omri (2021): Board Diversity and Corporate Social Responsibility: Empirical Evidence from France. *Journal of Business Ethics* 173 (2021)1: 133–155.

Bellemare, Marc F.; Takaaki Masaki; Thomas B. Pepinsky (2017): Lagged Explanatory Variables and the Estimation of Causal Effect. *The Journal of Politics* 79(2017)3: 949–963.

Ben-Amar, Walid; Millicent Chang; Philip McIlkenny (2017): Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project. *Journal of Business Ethics* 142(2017)2: 369–383.

Benlemlih, Mohammed; Amama Shaukat; Yan Qiu; Grzegorz Trojanowski (2018): Environmental and Social Disclosures and Firm Risk. *Journal of Business Ethics* 152(2018)3: 613–626.

Bennouri, Moez; Chiara De Amicis; Sonia Falconieri (2020): Welcome on Board: A Note on Gender Quotas Regulation in Europe. *Economics Letters* 190(2020): 109055.

Berrone, Pascual; Luis R. Gomez-Mejia (2009): Environmental Performance and Executive Compensation: An Integrated Agency-Institutional Perspective. *Academy of Management Journal* 52(2009)1: 103–126.

Bertrand, Marianne; Esther Duflo; Sendhil Mullainathan (2018): How Much Should We Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics* 119(2018)1: 249–275.

Bin Khidmat, Waqas; Muhammad Ayub Khan; Hashmat Ullah (2020): The Effect of Board Diversity on Firm Performance: Evidence from Chinese Listed Companies. *Indian Journal of Corporate Governance* 13(2020)1: 9–33.

Birindelli, Giuliana; Antonia P. Iannuzzi; Marco Savioli (2019): The Impact of Women Leaders on Environmental Performance: Evidence on Gender Diversity in Banks. *Corporate Social Responsibility and Environmental Management* 26(2019)6: 1485–1499.

Blaker, Nancy M.; Irene Rompa; Inge H. Dessing; Anne F. Vriend; Channah Herschberg; Mark Van Vugt (2013): The Height Leadership Advantage in Men and Women: Testing Evolutionary Psychology Predictions about the Perceptions of Tall Leaders. *Group Processes & Intergroup Relations* 16 (1): 17–27.

Blankespoor, Elizabeth; Ed deHaan; Iván Marinovic (2020): Disclosure Processing Costs, Investors' Information Choice, and Equity Market Outcomes: A Review. *Journal of Accounting and Economics* 70(2020)2–3: 1–46.

Blau, Peter M. (1968): The Hierarchy of Authority in Organizations. *American Journal of Sociology* 73(1968)4: 453–467.

Bonet, Rocio; Peter Cappelli; Monika Hamori (2020): Gender Differences in Speed of Advancement: An Empirical Examination of Top Executives in the Fortune 100 Firms. *Strategic Management Journal* 41(2020)4: 708–737.

Bout, Aubrey; Perla Cuevas; Jose Lawant; Brian Wilby (2023): S&P 500 CEO Compensation Increase Trends. *Pay Governance: Advisory Services in Compensation Committees*. [https://www.paygovernance.com/viewpoints/s-p-500-ceo-compensation-increase-trends-6, found on 14.01.2025].

Bowles, Hannah R.; Linda Babcock; Lei Lai (2007): Social Incentives for Gender Differences in the Propensity to Initiate Negotiations: Sometimes It Does Hurt to Ask. *Organizational Behavior and Human Decision Processes* 103(2007)1: 84–103.

Brammer, Stephen; Andrew Millington; Stephen Pavelin (2007): Gender and Ethnic Diversity among UK Corporate Boards. *Corporate Governance: An International Review* 15(2007)2: 393–403.

Brammer, Stephen; Stephen Pavelin (2008): Factors Influencing the Quality of Corporate Environmental Disclosure. *Business Strategy and the Environment* 17(2008)2: 120–136.

Brough, Aaron R.; James E. B. Wilkie; Jingjing Ma; Mathew S. Isaac; David Gal (2016): Is Eco-Friendly Unmanly? The Green-Feminine Stereotype and Its Effect on Sustainable Consumption. *Journal of Consumer Research* 43(2016)4: 567–582.

Busch, Anne; Elke Holst (2011): Gender-Specific Occupational Segregation, Glass Ceiling Effects, and Earnings in Managerial Positions: Results of a Fixed Effects Model. Berlin: Deutsches Institut für Wirtschaftsforschung, SOEPpapers on Multipliscinary Panel Data Research Nr. 357.

Bushee, Brian J.; Gregory S. Miller (2012): Investor Relations, Firm Visibility, and Investor Following. *The Accounting Review* 87(2012)3: 867–897.

Buss, David M. (1981): Sex Differences in the Evaluation and Performance of Dominant Acts. *Journal of Personality and Social Psychology* 40(1981)1: 147–154.

Carpenter, Mason A.; James B. Wade (2002): Microlevel Opportunity Structures as Determinants of Non-CEO Executive Pay. *Academy of Management Journal* 45(2002)6: 1085–1103.

Carré, Justin M.; Cheryl M. McCormick (2008): In Your Face: Facial Metrics Predict Aggressive Behaviour in the Laboratory and in Varsity and Professional Hockey Players. *Proceedings of the Royal Society B: Biological Sciences* 275(2008)1651: 2651–2656.

Carré, Justin M.; Cheryl M. McCormick; Catherine J. Mondloch (2009): Facial Structure Is a Reliable Cue of Aggressive Behavior. *Psychological Science* 20(2009)10: 1194–1198.

Carter, David A.; Frank D'Souza; Betty J. Simkins; Gary W. Simpson (2010): The Gender and Ethnic Diversity of US Boards and Board Committees and Firm Financial Performance. *Corporate Governance: An International Review* 18(2010)5: 396–414.

Carter, David A.; Betty J. Simkins; W. Gary Simpson (2003): Corporate Governance, Board Diversity, and Firm Value. *The Financial Review* 38(2003)1: 33–53.

Chang, Hsihui; Hiu L. Choy; Kam-Ming Wan (2012): Effect of the Sarbanes–Oxley Act on CEOs' Stock Ownership and Pay-Performance Sensitivity. *Review of Quantitative Finance and Accounting* 38(2012)2: 177–207.

Chen, Guoli; Po-Hsuan Hsu; Yen T. Lee; Daniel Z. Mack (2024): How Deep-level and Surface-level Board Diversity, Formal and Informal Social Structures Affect Innovation. *Journal of Management Studies* 62(2024)1: 65–101.

Chen, Hongquan; Saixing Zeng; Han Lin; Hanyang Ma (2017): Munificence, Dynamism, and Complexity: How Industry Context Drives Corporate Sustainability. *Business Strategy and the Environment* 26(2017)2: 125–141.

Chen, Xiaoqi; Wouter Torsin; Albert Tsang (2022): International Differences in the CEO Gender Pay Gap. *Corporate Governance: An International Review* 30(2022)5: 516–541.

Cheng, Beiting; Ioannis Ioannou; George Serafeim (2014): Corporate Social Responsibility and Access to Finance: CSR and Access to Finance. *Strategic Management Journal* 35(2014)1: 1–23.

Choi, Jung-Kyoo; Samuel Bowles (2007): The Coevolution of Parochial Altruism and War. *Science* 318(2007)5850: 636–640.

Claassen, Debbie; Claudia Ricci (2015): CEO Compensation Structure and Corporate Social Performance. *Die Betriebswirtschaft* 75(2015)5: 327–343.

Clark, Cynthia E.; Punit Arora; Patricia Gabaldon (2022): Female Representation on Corporate Boards in Europe: The Interplay of Organizational Social Consciousness and Institutions. *Journal of Business Ethics* 180(2022)1: 165–186.

Cucari, Nicola; Salvatore E. De Falco; Beatrice Orlando (2018): Diversity of Board of Directors and Environmental Social Governance: Evidence from Italian Listed Companies. *Corporate Social Responsibility and Environmental Management* 25(2018)3: 250–266.

Dalton, Dan R.; Catherine M. Daily; Trevis S. Certo (2003): Meta-Analysis of Financial Performance and Equity: Fusion or Confusion? *Academy of Management Journal* 48(2003)1: 13–26.

Dalton, Dan R.; Catherine M. Daily; Jonathan L. Johnson; Alan E. Ellstrand (1999): Number of Directors and Financial Performance: A Meta-Analysis. *Academy of Management Journal* 42(1999)6: 674–686.

Damanpour, Fariborz (2010): An Integration of Research Findings of Effects of Firm Size and Market Competition on Product and Process Innovations: Product and Process Innovations. *British Journal of Management* 21(2010)4: 996–1010.

Darmadi, Salim (2011): Board Diversity and Firm Performance: The Indonesian Evidence. *Corporate Ownership and Control* 8(2011)2: 450–466.

De Masi, Sara; Agnieszka Słomka-Gołębiowska; Andrea Paci (2021): Women on Boards and Monitoring Tasks: An Empirical Application of Kanter's Theory. *Management Decision* 59(2021)13: 56–72.

Deckop, John R.; Kimberly K. Merriman; Shruti Gupta (2006): The Effects of CEO Pay Structure on Corporate Social Performance. *Journal of Management* 32(2006)3: 329–342.

Dezső, Cristian L.; Yixuan Li; David G. Ross (2022): Female CEOs and the Compensation of Other Top Managers. *Journal of Applied Psychology* 107(2022)12: 2306–2318.

Dienes, Dominik; Patrick Velte (2016): The Impact of Supervisory Board Composition on CSR Reporting. Evidence from the German Two-Tier System. *Sustainability* 8(2016)1: 63.

Dinh, Jessica E.; Robert G. Lord; William L. Gardner; Jeremy D. Meuser; Robert C. Liden; Jinyu Hu (2014): Leadership Theory and Research in the New Millennium: Current Theoretical Trends and Changing Perspectives. *The Leadership Quarterly* 25(2014)1: 36–62.

Dobrev, Stanislav D.; Tai-Young Kim; Glenn R. Carroll (2003): Shifting Gears, Shifting Niches: Organizational Inertia and Change in the Evolution of the U.S. Automobile Industry, 1885–1981. *Organization Science* 14(2003)3: 264–282.

Drempetic, Samuel; Christian Klein; Bernhard Zwergel (2020): The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review. *Journal of Business Ethics* 167(2020)2: 333–360.

Duque-Grisales, Eduardo; Javier Aguilera-Caracuel (2021): Environmental, Social and Governance (ESG) Scores and Financial Performance of Multilatinas: Moderating Effects of Geographic International Diversification and Financial Slack. *Journal of Business Ethics* 168(2021)2: 315–334.

Dyck, Alexander; Karl V. Lins; Lukas Roth; Mitch Towner; Hannes F. Wagner (2023): Renewable Governance: Good for the Environment? *Journal of Accounting Research* 61(2023)1: 279–327.

Eagly, Alice H. (1987): Reporting Sex Differences. *American Psychologist* 42(1987)7: 756–757.

Eagly, Alice H. (2016): When Passionate Advocates Meet Research on Diversity, Does the Honest Broker Stand a Chance? *Journal of Social Issues* 72(2016)1: 199–222.

Eagly, Alice H.; Mary C. Johannesen-Schmidt; Marloes L. van Engen (2003): Transformational, Transactional, and Laissez-Faire Leadership Styles: A Meta-Analysis Comparing Women and Men. *Psychological Bulletin* 129(2003)4: 569–591.

Eagly, Alice H.; Steven J. Karau (1991): Gender and the Emergence of Leaders: A Meta-Analysis. *Journal of Personality and Social Psychology* 60(1991)5: 685–710.

Eagly, Alice H.; Steven J. Karau (2002): Role Congruity Theory of Prejudice toward Female Leaders. *Psychological Review* 109(2002)3: 573–598.

Eagly, Alice H.; Mona G. Makhijani; Bruce G. Klonsky (1992): Gender and the Evaluation of Leaders: A Meta-Analysis. *Psychological Bulletin* 111(1992)1: 3–22.

Eagly, Alice H.; Wendy Wood (1991): Explaining Sex Differences in Social Behavior: A Meta-Analytic Perspective. *Personality & Social Psychology Bulletin* 17 (3): 306–315.

Eagly, Alice H.; Wendy Wood; Amanda B. Diekman (2012): Social Role Theory of Sex Differences and Similarities: A Current Appraisal. In: Eckes, Thomas;

Hanns M. Trautner (Eds.): The Developmental Social Psychology of Gender. Mahwah: Psychology Press: 123–174.

Eccles, Robert G.; Ioannis Ioannou; George Serafeim (2014): The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science* 60(2014)11: 2835–2857.

Eckbo, B. Espen; Knut Nygaard; Karin S. Thorburn (2021): Valuation Effects of Norway's Board Gender-Quota Law Revisited. *Management Science* 68(2021)6: 4112–4134.

Edmans, Alex; Xavier Gabaix (2009): Is CEO Pay Really Inefficient? A Survey of New Optimal Contracting Theories. *European Financial Management* 15(2009)3: 486–496.

Edmans, Alex; Xavier Gabaix; Dirk Jenter (2017): Executive Compensation: A Survey of Theory and Evidence. In Benjamin E. Hermalin; Michael Weisbach (Eds.): The Handbook of the Economics of Corporate Governance, Vol. 1. Amsterdam: North-Holland: 383–539.

Elkinawy, Susan; Mark Stater (2011): Gender Differences in Executive Compensation: Variation with Board Gender Composition and Time. *Journal of Economics and Business* 63(2011)1: 23–45.

Endrikat, Jan; Charl de Villiers; Thomas W. Guenthe; Edeltraud M. Guenther (2021): Board Characteristics and Corporate Social Responsibility: A Meta-Analytic Investigation. *Business & Society* 60(2021)8: 2099–2135.

England, Paula (1999): The Case for Comparable Worth. *The Quarterly Review of Economics and Finance* 39(1999)5: 743–755.

England, Paula; George Farkas; Barbara Stanek Kilbourne; Thomas Dou (1988): Explaining Occupational Sex Segregation and Wages: Findings from a Model with Fixed Effects. *American Sociological Review* 53(1988)4: 544–558.

England, Paula; Joan M. Hermsen; David A. Cotter (2000): The Devaluation of Women's Work: A Comment on Tam. *American Journal of Sociology* 105(2000)6: 1741–1751.

Epitropaki, Olga; Robin Martin (2004): Implicit Leadership Theories in Applied Settings: Factor Structure, Generalizability, and Stability Over Time. *Journal of Applied Psychology* 89(2004)2: 293–310.

European Trade Union Confederation (2025): CEOs Paid over 100 Times More than Workers. [https://etuc.org/en/pressrelease/ceos-paid-over-100-times-more-workers, found on 17.01.2025].

European Union (2017): Directive (EU) 2017/828 of the European Parliament and of the Council of the European Union. EUR-Lex (2017). [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32017L0828, found on 03.05.2024].

Ferguson, Todd W. (2018): Female Leadership and Role Congruity within the Clergy: Communal Leaders Experience No Gender Differences Yet Agentic Women Continue to Suffer Backlash. *Sex Roles* 78(2018)5–6: 409–422.

Fernandez-Feijoo, Belen; Silvia Romero; Silvia Ruiz-Blanco (2014): Women on Boards: Do They Affect Sustainability Reporting?: Women on Boards: Do They Affect Sustainability Reporting? *Corporate Social Responsibility and Environmental Management* 21(2014)6: 351–364.

Fiechter, Peter; Jörg-Markus Hitz; Nico Lehmann (2022): Real Effects of a Widespread CSR Reporting Mandate: Evidence from the European Union's CSR Directive. *Journal of Accounting Research* 60(2022)4: 1499–1549.

Finkelstein, Sydney (1992): Power in Top Management Teams: Dimensions, Measurement, and Validation. *Academy of Management Journal* 35 (3): 505–538.

Fredrickson, James W.; Alison Davis-Blake; Wm. Gerard Sanders (2010): Sharing the Wealth: Social Comparisons and Pay Dispersion in the CEO's Top Team. *Strategic Management Journal* 31(1992)10: 1031–1053.

Freeman, Edward R. (1984): Strategic Management: A Stakeholder Approach. 2nd edition. Boston: Pitman.

Freeman, Edward R.; Sergiy D. Dmytriyev; Robert A. Phillips (2021): Stakeholder Theory and the Resource-Based View of the Firm. *Journal of Management* 47(2021)7: 1757–1770.

Frias-Aceituno, José V.; Lazaro Rodriguez-Ariza; I.M Garcia-Sanchez (2013): The Role of the Board in the Dissemination of Integrated Corporate Social Reporting: The Role of the Board in the Dissemination of Integrated Report. *Corporate Social Responsibility and Environmental Management* 20(2013)4: 219–233.

Fruhen, Laura S.; Christopher D. Watkins; Benedict C. Jones (2015): Perceptions of Facial Dominance, Trustworthiness and Attractiveness Predict Managerial Pay Awards in Experimental Tasks. *The Leadership Quarterly* 26(2015)6: 1005–1016.

Gao, Huasheng; Kai Li (2015): A Comparison of CEO Pay–Performance Sensitivity in Privately-Held and Public Firms. *Journal of Corporate Finance* 35(2015): 370–388.

García Lara; Juan M.; Jose Penalva; Mariano Scapin (2021): Financial Reporting Quality Effects of Imposing (Gender) Quotas on Boards of Directors. *Journal of Accounting and Public Policy* 41(2021)2: 106921.

Geniole, Shawn N.; Thomas F. Denson; Barnaby J. Dixson; Justin M. Carré; Cheryl M. McCormick (2015): Evidence from Meta-Analyses of the Facial Width-to-Height Ratio as an Evolved Cue of Threat. *PLOS ONE* 10(2015)7: e0132726.

Gerth, Martin; Daniel Schönwitz (2020): Belohnungen für Manager: Vorstandsvergütung auf Kosten der Aktionäre. *Die Zeit* (12.03.2020). [https://www.zeit.de/wirtschaft/unternehmen/2020-03/vorstand-gehaelter-aktionaere-eu-richtline].

Glass, Christy; Alison Cook; Alicia R. Ingersoll (2016): Do Women Leaders Promote Sustainability? Analyzing the Effect of Corporate Governance Composition on Environmental Performance: Women Leaders. *Business Strategy and the Environment* 25(2016)7: 495–511.

Gong, Yaping; Jing Zhou; Song Chang (2013): Core Knowledge Employee Creativity and Firm Performance: The Moderating Role of Riskiness Orientation, Firm Size; Realized Absorptive Capacity. *Personnel Psychology* 66(2013)2: 443–482.

Göx, Robert F. (2016): Wachstum und Höhe von Managementvergütungen: Theorien, empirische Befunde und deren Relevanz für den DAX 30. *Perspektiven der Wirtschaftspolitik* 17(2016)4: 311–334.

Gregory-Smith, Ian; Brian G. M. Main; Charles A. O'Reilly (2014): Appointments, Pay and Performance in UK Boardrooms by Gender. *The Economic Journal* 124(2014)574: 109–128.

Groening, Christopher (2019): When Do Investors Value Board Gender Diversity? *Corporate Governance: The International Journal of Business in Society* 19(2019)1: 60–79.

Guay, Wayne R.; John D. Kepler; David Tsui (2019): The Role of Executive Cash Bonuses in Providing Individual and Team Incentives. *Journal of Financial Economics* 133(2019)2: 441–471.

Gupta, Kamini; Donal Crilly; Thomas Greckhamer (2020): Stakeholder Engagement Strategies, National Institutions, and Firm Performance: A Configurational Perspective. *Strategic Management Journal* 41(2020)10: 1869–1900.

Gupta, Nandini (2005): Partial Privatization and Firm Performance. *The Journal of Finance* 60(2005)2: 987–1015.

Hafsi, Taïeb; Gokhan Turgut (2013): Boardroom Diversity and Its Effect on Social Performance: Conceptualization and Empirical Evidence. *Journal of Business Ethics* 112(2013)3: 463–479.

Hambrick, Donald C. (1987): The Top Management Team: Key to Strategic Success. *California Management Reviw* 30(1987)1: 88–108.

Hambrick, Donald C. (2007): Upper Echelons Theory: An Update. *Academy of Management Review* 32(2007)2: 334–343.

Hambrick, Donald C.; Sydney Finkelstein (1995): The Effects of Ownership Structure on Conditions at the Top: The Case of CEO Pay Raises. *Strategic Management Journal* 16(1995)3: 175–193.

Handschumacher-Knors, Franziska (2023): Does a Gender Pay Gap Exist on Executive Boards? An Empirical Multilevel Analysis of Executive Board Compensation in German Listed Companies. *Journal of Business Economics* 93(2023)3: 325–357.

Hannan, Michael T.; John Freeman (1977): The Population Ecology of Organizations. *American Journal of Sociology* 82(1977)5: 929–964.

Harjoto, Maretno A.; Hoje Jo (2011): Corporate Governance and CSR Nexus. *Journal of Business Ethics* 100(2011)1: 45–67.

Harjoto, Maretno A.; Indrarini Laksmana; Robert Lee (2015): Board Diversity and Corporate Social Responsibility. *Journal of Business Ethics* 132(2015)4: 641–660.

Harjoto, Maretno A.; Indrarini Laksmana; Ya Wen Yang (2019): Board Nationality and Educational Background Diversity and Corporate Social Performance. *Corporate Governance: The International Journal of Business in Society* 19(2019)2: 217–239.

Hart, Stuart L. (1995): A Natural-Resource-Based View of the Firm. *Academy of Management Review* 20(1995)4: 986–1014.

Haselhuhn, Michael P.; Elaine M. Wong; Margaret E. Ormiston; Ena M. Inesi; Adam D. Galinsky (2014): Negotiating Face-to-Face: Men's Facial Structure Predicts Negotiation Performance. *The Leadership Quarterly* 25(2014)5: 835–845.

Havrylyshyn, Andre; Donald J. Schepker; Anthony J. Nyberg (2023): In the Club? How Categorization and Contact Impact the Board Gender Diversity-Firm Performance Relationship. *Journal of Business Ethics* 184(2023)2: 353–374.

Hawn, Olga; Ioannis Ioannou (2016): Mind the Gap: The Interplay between External and Internal Actions in the Case of Corporate Social Responsibility. *Strategic Management Journal* 37(2016)13: 2569–2588.

He, Xiaoping; Shuo Jiang (2019): Does Gender Diversity Matter for Green Innovation? *Business Strategy and the Environment* 28(2019)7: 1341–1356.

Heilman, Madeline E.; Tyler G. Okimoto (2007): Why Are Women Penalized for Success at Male Tasks? The Implied Communality Deficit. *Journal of Applied Psychology* 92(2007)1: 81–92.

Heilman, Madeline E.; Aaron S. Wallen; Daniella Fuchs; Melinda M. Tamkins (2004): Penalties for Success: Reactions to Women Who Succeed at Male Gender-Typed Tasks. *Journal of Applied Psychology* 89(2004)3: 416–427.

Helfat, Constance E.; Dawn Harris; Paul J. Wolfson (2006): The Pipeline to the Top: Women and Men in the Top Executive Ranks of U.S. Corporations. *Academy of Management Perspectives* 20(2006)4: 42–64.

Hentschel, Tanja; Madeline E. Heilman; Claudia V. Peus (2019): The Multiple Dimensions of Gender Stereotypes: A Current Look at Men's and Women's Characterizations of Others and Themselves. *Frontiers in Psychology* 10(2019): 1-19.

Hill, Aaron D.; Scott G. Johnson; Lindsey M. Greco; Ernest H. O'Boyle; Sheryl L. Walter (2021): Endogeneity: A Review and Agenda for the Methodology-Practice Divide Affecting Micro and Macro Research. *Journal of Management* 47(2021)1: 105–143.

Hill, Charles W. L.; Phillip Phan (1991): CEO Tenure as a Determinant of CEO Pay. *Academy of Management Journal* 34(1991)3: 707–717.

Hillman, Amy J.; Albert A Cannella (2002): Women and Racial Minorities in the Boardroom: How Do Directors Differ? *Journal of Management*, 28(2002)6: 747-763.

Hillman, Amy J.; Thomas Dalziel (2003): Boards of Directors and Firm Performance: Integrating Agency and Resource Dependence Perspectives. *Academy of Management Review* 28(2003)3: 383–396.

Hillman, Amy J.; Gerald D. Keim; Rebecca A. Luce (2001): Board Composition and Stakeholder Performance: Do Stakeholder Directors Make a Difference? *Business & Society* 40(2001)3: 295–314.

Holmstrom, Bengt (1979): Moral Hazard and Observability. *The Bell Journal of Economics* 10(1979)1: 74–91.

Hoynes, Hilary; Diane W. Schanzenbach; Douglas Almond (2016): Long-Run Impacts of Childhood Access to the Safety Net. *American Economic Review* 106(2016)4: 903–934.

Hunter, Lori M.; Alison Hatch; Aaron Johnson (2004): Cross-National Gender Variation in Environmental Behaviors. *Social Science Quarterly* 85(2004)3: 677–694.

Huq, Fahian A.; Ilma N. Chowdhury; Robert D. Klassen (2016): Social Management Capabilities of Multinational Buying Firms and Their Emerging Market Suppliers: An Exploratory Study of the Clothing Industry. *Journal of Operations Management* 46(2016)1: 19–37.

Ioannou, Ioannis; George Serafeim (2012): What Drives Corporate Social Performance? The Role of Nation-Level Institutions. *Journal of International Business Studies* 43(2012)9: 834–864.

Islam, Ranjita; Erica French; Muhammad Ali (2022): Evaluating Board Diversity and Its Importance in the Environmental and Social Performance of Organizations. *Corporate Social Responsibility and Environmental Management* 29(2022)5: 1134–1145.

Ismail, Aida M.; Siti M. Ahmadi; Normahiran Yatim; Puteh M. Ismail (2020): The Impact of Board Characteristics on Co-Operative Reputation from the Lense of Resource-Based View Theory (RBVT). *International Journal of Financial Research* 11(2020)3: 43–61.

Ismail, Aida M.; Izrul H. M. Latiff (2019): Board Diversity and Corporate Sustainability Practices: Evidence on Environmental, Social and Governance (ESG) Reporting. *International Journal of Financial Research* 10(2019)3: 31–50.

Jain, Tanusree; Dima Jamali (2016): Looking Inside the Black Box: The Effect of Corporate Governance on Corporate Social Responsibility. *Corporate Governance: An International Review* 24(2016)3: 253–273.

Jensen, Michael C.; William H. Meckling (1976): Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3(1976): 305–360.

Jensen, Michael C.; Kevin J. Murphy (1990): Performance Pay and Top-Management Incentives. *Journal of Political Economy* 98(1990)2: 225–264.

Jeong, Seung-Hwan; David A. Harrison (2017): Glass Breaking, Strategy Making, and Value Creating: Meta-Analytic Outcomes of Women as CEOs and TMT Members. *Academy of Management Journal* 60(2017)4: 1219–1252.

Jo, Hoje; Maretno A. Harjoto (2011): Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility. *Journal of Business Ethics* 103(2011)3: 351–583.

Joecks, Jasmin; Kerstin Pull; Katrin Scharfenkamp (2019): Perceived Roles of Women Directors on Supervisory Boards: Insights from a Qualitative Study. *German Journal of Human Resource Management: Zeitschrift Für Personalforschung* 33(2019)1: 5–31.

Joecks, Jasmin; Kerstin Pull; Katrin Scharfenkamp (2024): Women Directors, Board Attendance, and Corporate Financial Performance. *Corporate Governance: An International Review* 32(2024)2: 205–227.

Josefy, Matthew; Scott Kuban; Duane R. Ireland; Michael A. Hitt (2015): All Things Great and Small: Organizational Size, Boundaries of the Firm, and a Changing Environment. *Academy of Management Annals* 9(2015)1: 715–802.

Jouber, Habib (2021): Is the Effect of Board Diversity on CSR Diverse? New Insights from One-Tier vs Two-Tier Corporate Board Models. *Corporate Governance: The International Journal of Business in Society* 21(2021)1: 23–61.

Kakkar, Hemant; Niro Sivanathan; Matthias S. Gobel (2020): Fall from Grace: The Role of Dominance and Prestige in the Punishment of High-Status Actors. *Academy of Management Journal* 63(2020)2: 530–553.

Kanter, Rosabeth Moss (1977): Men and Women of the Organization. New York: Basic Books.

Kassinis, George; Alexia Panayiotou; Andreas Dimou; Georgia Katsifaraki (2016): Gender and Environmental Sustainability: A Longitudinal Analysis. *Corporate Social Responsibility and Environmental Management* 23(2016)6: 399–412.

Katmon, Nooraisah; Zam Z. Mohamad; Norlia M. Norwani; Omar A. Farooque (2019): Comprehensive Board Diversity and Quality of Corporate Social Responsibility Disclosure: Evidence from an Emerging Market. *Journal of Business Ethics* 157(2019)2: 447–481.

Keeves, Gareth D.; James D. Westphal (2021): From Help to Harm: Increases in Status, Perceived Under-Reciprocation, and the Consequences for Access to Strategic Help and Social Undermining Among Female, Racial Minority, and White Male Top Managers. *Organization Science* 32(2021)4: 1120–1148.

Kelling, Nikolas K.; Philipp C. Sauer; Stefan Gold; Stefan Seuring (2021): The Role of Institutional Uncertainty for Social Sustainability of Companies and Supply Chains. *Journal of Business Ethics* 173(2021)4: 813–833.

Khan, Ismail; Iftikhar Khan; Ikram U. Khan; Shahida Suleman; Shoukat Ali (2024): Board Diversity on Firm Performance from Resource-Based View Perspective: New Evidence from Pakistan. *International Journal of Productivity and Performance Management* 73(2024)3: 649–675.

Khan, Ismail; Imran Khan; Bilal bin Saeed (2019): Does Board Diversity Affect Quality of Corporate Social Responsibility Disclosure? Evidence from Pakistan. *Corporate Social Responsibility and Environmental Management* 26(2019)6: 1371–1381.

Kim, Jennifer Y.; Alyson Meister (2023): Microaggressions, Interrupted: The Experience and Effects of Gender Microaggressions for Women in STEM. *Journal of Business Ethics* 185(2023)3: 513–531.

Kirsch, Anja (2018): The Gender Composition of Corporate Boards: A Review and Research Agenda. *The Leadership Quarterly* 29(2018)2: 346–364.

Koenig, Anne M.; Alice H. Eagly; Abigail A. Mitchell; Tiina Ristikari (2011): Are Leader Stereotypes Masculine? A Meta-Analysus of Three Research Paradigms. *Psychological Bulletin* 137(2011)4: 616–642.

Kolk, Ans; Paolo Perego (2014): Sustainable Bonuses: Sign of Corporate Responsibility or Window Dressing? *Journal of Business Ethics* 119(2014)1: 1–15.

Kraus, Vered; Yuval P. Yonay (2000): The Effect of Occupational Sex Composition on the Gender Gap in Workplace Authority. *Social Science Research* 29(2000)4: 583–605.

Kulich, Clara; Grzegorz Trojanowski; Michelle K. Ryan; Alexander S. Haslam; Luc D. R. Renneboog (2011): Who Gets the Carrot and Who Gets the Stick? Evidence of Gender Disparities in Executive Remuneration. *Strategic Management Journal* 32(2011)3: 301–321.

Leslie, Lisa M.; Colleen F. Manchester; Patricia C. Dahm (2017): Why and When Does the Gender Gap Reverse? Diversity Goals and the Pay Premium for High Potential Women. *Academy of Management Journal* 60(2017)2: 402–432.

Levanon, Asaf; Paula England; Paul Allison (2009): Occupational Feminization and Pay: Assessing Causal Dynamics Using 1950-2000 U.S. Census Data. *Social Forces* 88(2009)2: 865–891.

Lewellyn, Krista B.; Maureen I. Muller-Kahle (2020): The Corporate Board Glass Ceiling: The Role of Empowerment and Culture in Shaping Board Gender Diversity. *Journal of Business Ethics* 165(2020)2: 329–346.

Leyva-de La Hiz, Dante I.; Vera Ferron-Vilchez; Alberto J. Aragon-Correa (2019): Do Firms' Slack Resources Influence the Relationship between Focused Environmental Innovations and Financial Performance? More Is Not Always Better. *Journal of Business Ethics* 159(2019)4: 1215–1227.

Li, Ji; Fuqiang Zhao; Silu Chen; Wanxing Jiang; Tao Liu; Shengping Shi (2017): Gender Diversity on Boards and Firms' Environmental Policy: Gender Diversity on Boards. *Business Strategy and the Environment* 26(2017)3: 306–315.

Li, Yan-xi; Chao He (2023): Board Diversity and Corporate Innovation: Evidence from Chinese Listed Firms. *International Journal of Finance & Economics* 28(2023)1: 1092–1115.

Liao, Lin; Le Luo; Qingliang Tang (2015): Gender Diversity, Board Independence, Environmental Committee and Greenhouse Gas Disclosure. *The British Accounting Review* 47(2015)4: 409–424.

Lin, Karen Jingrong; Xiaoyan Lu; Junsheng Zhang; Ying Zheng (2020): State-Owned Enterprises in China: A Review of 40 Years of Research and Practice. *China Journal of Accounting Research* 13(2020)1: 31–55.

Lord, Robert G. (1985): An Information Processing Approach to Social Perceptions, Leadership and Behavioral Measurement in Organizations. *Research in Organizational Behavior* 7(1985): 87–128.

Lord, Robert G.; Christy L. De Vader; George M. Alliger (1986): A Meta-Analysis of the Relation Between Personality Traits and Leadership Perceptions: An Application of Validity Generalization Procedures. *Journal of Applied Psychology* 71(1986)3: 402–410.

Lückerath-Rovers, Mijntje (2013): Women on Boards and Firm Performance. *Journal of Management & Governance* 17(2013)2: 491–509.

Maner, Jon K.; Charleen R. Case (2016): Dominance and Prestige. In: Gawronski, Bertram (Ed.): Advances in Experimental Social Psychology, Vol. 54. Elsevier: 129–180.

Manita, Riadh; Maria G. Bruna; Rey Dang; L'Hocine Houanti (2018): Board Gender Diversity and ESG Disclosure: Evidence from the USA. *Journal of Applied Accounting Research* 19(2018)2: 206–224.

Manner, Mikko H. (2010): The Impact of CEO Characteristics on Corporate Social Performance. *Journal of Business Ethics* 93(2010)1: 53–72.

Markóczy, Lívia; Sunny L. Sun; Jigao Zhu (2021): The Glass Pyramid: Informal Gender Status Hierarchy on Boards. *Journal of Business Ethics* 168(2021)4: 827–845.

Mateos De Cabo, Ruth; Pilar Grau; Ricardo Gimeno; Patricia Gabaldón (2022): Shades of Power: Network Links with Gender Quotas and Corporate Governance Codes. *British Journal of Management* 33(2022)2: 703–723.

Matsa, David A.; Amalia R. Miller (2013): A Female Style in Corporate Leadership? Evidence from Quotas. *American Economic Journal: Applied Economics* 5(2013)3: 136–169.

McGuire, Jean; Sandra Dow; Kamal Argheyd (2003): CEO Incentives and Corporate Social Performance. *Journal of Business Ethics* 45(2003): 341–359.

McWilliams, Abagail; Donald Siegel (2000): Corporate Social Responsibility and Financial Performance: Correlation or Misspecification? *Strategic Management Journal* 21(2000)5: 603–609.

McWilliams, Abagail; Donald Siegel (2001): Corporate Social Responsibility: A Theory of the Firm Perspective. *Academy of Management Review* 26(2001)1: 117–127.

Mellahi, Kamel; Adrian Wilkinson (2010): A Study of the Association between Level of Slack Reduction Following Downsizing and Innovation Output. *Journal of Management Studies* 47(2010)3: 483–508.

Menicucci, Elisa; Guido Paolucci (2022): Board Diversity and ESG Performance: Evidence from the Italian Banking Sector. *Sustainability* 14(2022)20: 13447.

Merino, Elena; Montserrat Manzaneque (2016): Board of Directors as a Corporate Governance Mechanism: Principles, Practices, Proposals and New Challenges. In: Klein, Edmund (Ed): Corporate Governance: Principles, Practices and Challenges. New York: Nova Science Publishers: 1–31.

Meznar, Martin B.; Douglas Nigh (1995): Buffer or Bridge? Environmental and Organizational Determinants of Public Affairs Activities in American Firms. *Academy of Management Journal* 38(1995)4: 975–996.

Miletkov, Mihail; Annette Poulsen; Babajide M. Wintoki (2017): Foreign Independent Directors and the Quality of Legal Institutions. *Journal of International Business Studies* 48(2017)2: 267–292.

Mitra, Arjun; Corinne Post; Steve Sauerwald (2021): Evaluating Board Candidates: A Threat-Contingency Model of Shareholder Dissent Against Female Director Candidates. *Organization Science* 32(2021)1: 86–110.

Mohan, Nancy (2014): A Review of the Gender Effect on Pay, Corporate Performance and Entry into Top Management. *International Review of Economics & Finance* 34(2014):41–51.

Monteiro, Albertina P.; Catarina Cepêda; Amélia F. Da Silva (2024): Does the Workforce and Sustainability Reports Strengthen the Relationship between Gender Diversity and Sustainability Performance Reporting? *Administrative Sciences* 14(2024)6: 105.

Monteiro, Albertina P.; Isabel-María García-Sánchez; Beatriz Aibar-Guzmán (2022): Labour Practice, Decent Work and Human Rights Performance and Reporting: The Impact of Women Managers. *Journal of Business Ethics* 180(2022)2: 523–542.

Mooney, Attracta (2021): Female Board Members at FTSE 100 Companies Paid 40% Less than Men. *Financial Times* (22.08.2021). [https://www.ft.com/content/96b90579-b7cd-44a8-ba7e-cad6be5c6faa].

Murphy, Kevin J. (2013): Executive Compensation: Where We Are; How We Got There. In: Constantinides, George M.; Milton Harris; René Stulz (Eds.): Handbook of the Economics of Finance, Vol. 2. Elsevier: 211–356.

Murphy, Kevin J; Ján Zábojník (2004): CEO Pay and Appointments: A Market-Based Explanation for Recent Trends. *American Economic Review* 94(2004)2: 192–196.

Murphy, Kevin R.; Herman Aguinis (2022): Reporting Interaction Effects: Visualization, Effect Size, and Interpretation. *Journal of Management* 48(2022)8: 2159–2166.

Nadeem, Muhammad; Stepen Bahadar; Ali G. Amar; Umer Iqbal (2020): Are Women Eco-Friendly? Board Gender Diversity and Environmental Innovation. *Business Strategy and the Environment* 29(2020): 3146–3161.

Nahavandi, Afsaneh; Ali R. Malekzadeh (1993): Leader Style in Strategy and Organizational Performance: An Integrative Framework. *Journal of Management Studies* 30(1993)3: 405–425.

Nelson, Richard R.; Sidney G. Winter (1982): An Evolutionary Theory of Economic Change. Cambridge: Harvard University Press.

Nguyen, Tuan; Stuart Locke; Krishna Reddy (2015): Does Boardroom Gender Diversity Matter? Evidence from a Transitional Economy. *International Review of Economics & Finance* 37(2015):184–202.

Noser, Emilou; Jessica Schoch; Ulrike Ehlert (2018): The Influence of Income and Testosterone on the Validity of Facial Width-to-Height Ratio as a Biomarker for Dominance. *PLOS ONE* 13(2018)11: e0207333.

Ocasio, William (1994): Political Dynamics and the Circulation of Power: CEO Succession in U.S. Industrial Corporations, 1960-1990. *Administrative Science Quarterly* 39(1994)2: 285–312.

O'Neill, Hugh M.; Charles B. Saunders; Anne D. McCarthy (1989): Board Members, Corporate Social Responsiveness and Profitability: Are Tradeoffs Necessary? *Journal of Business Ethics* 8(1989)5: 353–357.

Orlitzky, Marc (2001): Does Firm Size Confound the Relationship Between Corporate Social Performance and Firm Financial Performance? *Journal of Business Ethics* 33(2001): 167–180.

Oxelheim, Lars; Trond Randøy (2003): The Impact of Foreign Board Membership on Firm Value. *Journal of Banking & Finance* 27(2003)12: 2369–2392.

Paolone, Francesco; Matteo Pozzoli; Meghna Chhabra; Assunta Di Vaio (2024): Cultural and Gender Diversity for ESG Performance towards Knowledge Sharing: Empirical Evidence from European Banks. *Journal of Knowledge Management* 28(2024)11: 106–131.

Papadakis, Vassilis M. (2006): Do CEOs Shape the Process of Making Strategic Decisions? Evidence from Greece. *Management Decision* 44(2006)3: 367–394.

Parker, Owen; Rachel Mui; Varkey Titus (2020): Unwelcome Voices: The Gender Bias-Mitigating Potential of Unconventionality. *Strategic Management Journal* 41(2020)4: 738–757.

Pearce, John A.; Shaker A. Zahra (1991): The Relative Power of CEOs and Boards of Directors: Associations with Corporate Performance. *Strategic Management Journal* 12(1991)2: 135–153.

Pearce, John A.; Shaker A. Zahra (1992): Board Composition from a Strategic Contingency Perspective. *Journal of Management Studies* 29(1992)4: 411–438.

Petersen, Trond; Ishak Saporta (2004): The Opportunity Structure for Discrimination. *American Journal of Sociology* 109(2004)4: 852–901.

Pfeffer, Jeffrey (1972): Size and Composition of Corporate Boards of Directors: The Organization and Its Environment. *Administrative Science Quarterly* 17(1972)2: 218–228.

Pfeffer, Jeffrey; Geralt R. Salancik (1978): The External Control of Organizations: A Resource Dependence Approach. New York: Harper and Row.

Phillips, Anne; Barbara Taylor (1980): Sex and Skill: Notes towards a Feminist Economics. *Feminist Review* 6(1980)1: 79–88.

Pissaris, Seema; Angela Heavey; Peggy Golden (2017): Executive Pay Matters: Looking Beyond the CEO to Explore Implications of Pay Disparity on Non-CEO Executive Turnover and Firm Performance. *Human Resource Management* 56(2017)2: 307–327.

Post, Corinne; Kris Byron (2015): Women on Boards and Firm Financial Performance: A Meta-Analysis. *Academy of Management Journal* 58(2015)5: 1546–1571.

Post, Corinne; Noushi Rahman; Cathleen McQuillen (2015): From Board Composition to Corporate Environmental Performance Through Sustainability-Themed Alliances. *Journal of Business Ethics* 130(2015)2: 423–435.

Post, Corinne; Noushi Rahman; Emily Rubow (2011): Green Governance: Boards of Directors' Composition and Environmental Corporate Social Responsibility. *Business & Society* 50(2011)1: 189–223.

Powell, Walter W. (1991): Expanding the Scope of Institutional Analysis. In: Powell, Walter W.; Paul J. DiMaggio (Eds.): The New Institutionalism in Organizational Analysis. Chicago: The University of Chicago Press: 183–204.

Prentice, Deborah A.; Erica Carranza (2002): What Women and Men Should Be, Shouldn't Be, Are Allowed to Be, and Don't Have to Be: The Contents of Prescriptive Gender Stereotypes. *Psychology of Women Quarterly* 26(2002)4: 269–281.

Rahdari, Amir H.; Ali A. A. Rostamy (2015): Designing a General Set of Sustainability Indicators at the Corporate Level. *Journal of Cleaner Production* 108(2015): 757–771.

Rao, Kathyayini; Carol Tilt (2016): Board Composition and Corporate Social Responsibility: The Role of Diversity, Gender, Strategy and Decision Making. *Journal of Business Ethics* 138(2016)2: 327–347.

Rebérioux, Antoine; Gwenaël Roudaut (2019): The Role of Rookie Female Directors in a Post-Quota Period: Gender Inequalities within French Boards. *Industrial Relations: A Journal of Economy and Society* 58(2019)3: 423–483.

Reed, William R. (2015): On the Practice of Lagging Variables to Avoid Simultaneity. *Oxford Bulletin of Economics and Statistics* 77(2015)6: 897–905.

Refinitiv (2021): Environmental, Social and Governance Scores from Refinitiv. [https://cdn-blob.investsmart.com.au/documents/REFINITIV%20ESG%20Scores%20Methodology%20Feb%202021.pdf, found on 04.12.2022].

Regierungskommission GCGC (2022): German Corporate Governance Code. [https://www.dcgk.de//files/dcgk/usercontent/en/download/code/220627_German_Corporate_Governance_Code_2022.pdf, found on 11.10.2024]

Reichel, Astrid; Isabella Scheibmayr; Julia Brandl (2020): The HR Lady Is on Board: Untangling the Link between HRM's Feminine Image and HRM's Board Representation. *Human Resource Management Journal* 30(2020)4: 586–603.

Reverte, Carmelo (2009): Determinants of Corporate Social Responsibility Disclosure Ratings by Spanish Listed Firms. *Journal of Business Ethics* 88(2009)2: 351–366.

Ridgeway, Cecilia L. (2001): Gender, Status, and Leadership. *Journal of Social Issues* 57(2001)4: 637–655.

Rudman, Laurie A. (1998): Self-Promotion as a Risk Factor for Women: The Costs and Benefits of Counterstereotypical Impression Management. *Journal of Personality and Social Psychology* 74(1998)3: 629–645.

Rudman, Laurie A.; Stephen E. Kilianski (2000): Implicit and Explicit Attitudes Toward Female Authority. *Personality and Social Psychology Bulletin* 26(2000)11: 1315–1328.

Rudman, Laurie A.; Julie E. Phelan (2008): Backlash Effects for Disconfirming Gender Stereotypes in Organizations. *Research in Organizational Behavior* 28(2008): 61–79.

Rush, Michael C.; Joyce E.A. Russell (1988): Leader Prototypes and Prototype-Contingent Consensus in Leader Behavior Descriptions. *Journal of Experimental Social Psychology* 24(1988)1: 88–104.

Schein, Virginia E.; Marilyn J. Davidson (1993): Think Manager, Think Male. *Management Development Review* 6(1993)3: 33–41.

Schneider, Martin R.; Anja Iseke; Kerstin Pull (2021): The Gender Pay Gap in European Executive Boards: The Role of Executives' Pathway into the Board. *The International Journal of Human Resource Management* 32(2021)14: 2952–2974.

Schultz, Emma; Gloria Y. Tian; Garry Twite (2013): Corporate Governance and the CEO PayPerformance Link: Australian Evidence. *International Review of Finance* 13(2013)4: 447–472.

Shaukat, Amama; Yan Qiu; Grzegorz Trojanowski (2016): Board Attributes, Corporate Social Responsibility Strategy, and Corporate Environmental and Social Performance. *Journal of Business Ethics* 135(2016)3: 569–585.

Siegel, Phyllis A.; Donald C. Hambrick (2005): Pay Disparities Within Top Management Groups: Evidence of Harmful Effects on Performance of High-Technology Firms. *Organization Science* 16(2005)3: 259–274.

Smith, Nina; Valdemar Smith; Mette Verner (2011): The Gender Pay Gap in Top Corporate Jobs in Denmark: Glass Ceilings, Sticky Floors or Both? *International Journal of Manpower* 32(2011)2: 156–177.

Solal, Isabelle; Kaisa Snellman (2019): Women Don't Mean Business? Gender Penalty in Board Composition. *Organization Science* 30(2019)6: 1270–1288.

Steinberg, Ronnie J. (1990): Social Construction of Skill: Gender, Power, and Comparable Worth. *Work and Occupations* 17(1990)4: 449–482.

Stiebale, Joel (2011): Do Financial Constraints Matter for Foreign Market Entry? A Firm-Level Examination. *The World Economy* 34(2011)1: 123–153.

Stojmenovska, Dragana; Stephanie Steinmetz; Beate Volker (2021): The Gender Gap in Workplace Authority: Variation across Types of Authority Positions. *Social Forces* 100(2021)2: 599–621.

Surroca, Jordi A.; Ruth V. Aguilera; Kurt Desender; Josep A. Tribó (2020): Is Managerial Entrenchment Always Bad and Corporate Social Responsibility Always Good? A Cross-National Examination of Their Combined Influence on Shareholder Value. *Strategic Management Journal* 41(2020)5: 891–920.

Talavera, Oleksandr; Shuxing Yin; Mao Zhang (2018): Age Diversity, Directors' Personal Values, and Bank Performance. *International Review of Financial Analysis* 55(2018): 60–79.

Tam, Tony (1997): Sex Segregation and Occupational Gender Inequality in the United States: Devaluation or Specialized Training? *American Journal of Sociology* 102(1997)6: 1652–1692.

Teece, David J.; Gary Pisano; Amy Shuen (1997): Dynamic Capabilities and Strategic Management. *Strategic Management Journal* 18(1997)7: 509–533.

Terjesen, Siri; Ruth V. Aguilera; Ruth Lorenz (2015): Legislating a Woman's Seat on the Board: Institutional Factors Driving Gender Quotas for Boards of Directors. *Journal of Business Ethics* 128(2015)2: 233–251.

Tingbani, Ishmael; Lyton Chithambo; Venancio Tauringana; Nikolaos Papanikolaou (2020): Board Gender Diversity, Environmental Committee and Greenhouse Gas Voluntary Disclosures. *Business Strategy and the Environment* 29(2020)6: 2194–2210.

Todorov, Alexander; Christopher Y. Olivola; Ron Dotsch; Peter Mende-Siedlecki (2015): Social Attributions from Faces: Determinants, Consequences, Accuracy, and Functional Significance. *Annual Review of Psychology* 66(2015)1: 519–545.

Triana, María del Carmen; Toyah L. Miller; Tiffany M. Trzebiatowski (2014): The Double-Edged Nature of Board Gender Diversity: Diversity, Firm Performance; the Power of Women Directors as Predictors of Strategic Change. *Organization Science* 25(2014)2: 609–632.

Um, Cyril T.; Shiau-Ling Guo; Fabrice Lumineau; Wei Shi; Ruixiang Song (2022): The Downside of CFO Function-Based Language Incongruity. *Academy of Management Journal* 65(2022)6: 1984–2013.

United Nations (2004): Who Cares Wins: Connecting Financial Markets to a Changing World. [https://documents1.worldbank.org/curated/pt/280911488968799581/pdf/113237-WP-WhoCaresWins-2004.pdf, found on 12.10.2024].

United Nations Development Programme (2023): Building a Sustainable Future: ESG Business Handbook. [https://www.undp.org/sites/g/files/zskgke326/files/2023-08/building_a_sustainable_future_esg_business_handbook.pdf, found on 12.10.2024].

U.S. Securities and Exchange Commission (2022): SEC Adopts Pay Versus Performance Disclosure Rules. SEC Adopts Pay Versus Performance Disclosure Rules. [https://www.sec.gov/newsroom/press-releases/2022-149, found on 14.01.2025].

Van Essen, Marc; Jordan Otten; Edward J. Carberry (2015): Assessing Managerial Power Theory: A Meta-Analytic Approach to Understanding the Determinants of CEO Compensation. *Journal of Management* 41(2015)1: 164–202.

Vial, Andrea C.; Jaime L. Napier; Victoria L. Brescoll (2016): A Bed of Thorns: Female Leaders and the Self-Reinforcing Cycle of Illegitimacy. *The Leadership Quarterly* 27(2016)3: 400–414.

de Villiers, Charl; Vic Naiker; Chris J. van Staden (2011): The Effect of Board Characteristics on Firm Environmental Performance. *Journal of Management* 37(2011)6: 1636–1663.

Voss, Glenn B.; Deepak Sirdeshmukh; Zannie G. Voss (2008): The Effects of Slack Resources and Environmental Threat on Product Exploration and Exploitation. *Academy of Management Journal* 51(2008)1: 147–164.

Wagner, David G.; Joseph Berger (1997): Gender and Interpersonal Task Behaviors: Status Expectation Accounts. *Sociological Perspectives* 40(1997)1: 1–32.

Walls, Judith L.; Pascual Berrone (2017): The Power of One to Make a Difference: How Informal and Formal CEO Power Affect Environmental Sustainability. *Journal of Business Ethics* 145(2017)2: 293–308.

Walls, Judith L.; Pascual Berrone; Phillip H. Phan (2012): Corporate Governance and Environmental Performance: Is There Really a Link? *Strategic Management Journal* 33(2012)8: 885–913.

Walls, Judith L.; Phillip H. Phan; Pascual Berrone (2011): Measuring Environmental Strategy: Construct Development, Reliability, and Validity. *Business & Society* 50(2011)1: 71–115.

Wang, Joyce C.; Lívia Markóczy; Sunny Li Sun; Mike W. Peng (2019): She'-E-O Compensation Gap: A Role Congruity View. *Journal of Business Ethics* 159(2019)3: 745–760.

Wernerfelt, Birger (1984): A Resource-Based View of the Firm. *Strategic Management Journal* 5(1984)2: 171–810.

Wickert, Christopher; Andreas G. Scherer; Laura J. Spence (2016): Walking and Talking Corporate Social Responsibility: Implications of Firm Size and Organizational Cost. *Journal of Management Studies* 53(2016)7: 1169–1196.

Wiggins, Jerry S. (1979): A Psychological Taxonomy of Trait-Descriptive Terms: The Interpersonal Domain. *Journal of Personality and Social Psychology* 37(1979)3: 395–412.

Williamson, Sarah K. (2023): Pay For Performance Or Skin In The Game? *Forbes* (24.05.2023). [https://www.forbes.com/sites/sarahkeohanewilliamson/2023/03/24/pay-for-performance-or-skin-in-the-game/].

Wooldridge, Jeffrey M. (2010): Econometric Analysis of Cross Section and Panel Data. 2nd edition. Cambridge: MIT Press.

Wu, Weiwei; Zhou Liang; Qi Zhang (2020): Effects of Corporate Environmental Responsibility Strength and Concern on Innovation Performance: The Moderating Role of Firm Visibility. *Corporate Social Responsibility and Environmental Management* 27(2020)3: 1487–1497.

Xie, Qunyong (2014): CEO Tenure and Ownership Mode Choice of Chinese Firms: The Moderating Roles of Managerial Discretion. *International Business Review* 23(2014)5: 910–919.

Yanadori, Yoshio; Jill A. Gould; Carol T. Kulik (2018): A Fair Go? The Gender Pay Gap among Corporate Executives in Australian Firms. *The International Journal of Human Resource Management* 29(2018)9: 1636–1660.

Yang, Philip; Sarah Diederich; Jan Riepe (2024): A Sizable Advantage: Environmental and Social Performance Implications of Board Gender Diversity [Unpublished Manuscript].

Yang, Philip; Jan Riepe; Katharina Moser; Kerstin Pull; Siri Terjesen (2019): Women Directors, Firm Performance, and Firm Risk: A Causal Perspective. *The Leadership Quarterly* 30(2019)5: 101297.

Yermack, David (1996): Higher Market Valuation of Companies with a Small Board of Directors. *Journal of Financial Economics* 40(1996)2: 185–211.

Zahra, Shaker A.; John A. Pearce (1989): Boards of Directors and Corporate Financial Performance: A Review and Integrative Model. *Journal of Management* 15(1989)2: 291–334.

Zelezny, Lynnette C.; Poh-Pheng Chua; Christina Aldrich (2000): Elaborating on Gender Differences in Environmentalism 56(2000)3: 443–457.

Zhang, Letian (2020): An Institutional Approach to Gender Diversity and Firm Performance. *Organization Science* 31(2020)2: 439–457.

Zhang, Yanlong; Heli Wang; Xiaoyu Zhou (2020): Dare to Be Different? Conformity versus Differentiation in Corporate Social Activities of Chinese Firms and Market Responses. *Academy of Management Journal* 63(2020)3: 717–742.

Zona, Fabio; Alessandro Zattoni; Alessandro Minichilli (2013): A Contingency Model of Boards of Directors and Firm Innovation: The Moderating Role of Firm Size: Contingency Contexts of Boards. *British Journal of Management* 24(2013)3: 299–315.