



# The Influence of Corporate Elites on Women on Supervisory Boards: Female Directors' Inclusion in Germany

Jie Huang<sup>1</sup> · Marjo-Riitta Diehl<sup>1</sup> · Sandra Paterlini<sup>2,3</sup>

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## Abstract

Although we can observe noticeable progress in gender diversity on corporate boards, these boards remain far from gender balanced. Our paper builds on social identity theory to examine the impact of corporate elites—men and women who sit on multiple corporate boards—on board diversity. We extend the main argument of social identity theory concerning favouritism based on homophily by suggesting that boards with men with multiple appointments are unwilling to include female board members to protect the monopoly value generated by their elite status. The empirical analysis, based on DAX 30 firms in the period of 2010–2015, shows that the presence of multi-board men is negatively associated with women's participation, while the presence of multi-board women and other women on management boards is positively related to gender diversity on boards. Furthermore, robustness tests support and confirm our conclusion that multi-board men have a significant association with board diversity, even with small size (i.e. 1 or 2). Additionally, we find a significant effect arising from pressure related to the introduction of gender quotas in Germany, effective in 2016, indicating the effectiveness of gender quota policies for board gender diversity.

**Keywords** Board diversity · Corporate elite · Social identity theory

## Introduction

Women have been underrepresented on corporate boards for a long time, even though the possible benefits of their inclusion are many, ranging from improved productivity and size of the talent pool to corporate social responsibility and the satisfaction of stakeholder pressures for gender balance (Bear et al. 2010; Oakley 2000; Terjesen and Sealy 2016). Moreover, gender diversity in boardrooms is an ethical issue for companies and concerns overall social welfare and equal

opportunities in societies (Carrasco et al. 2015; Terjesen and Sealy 2016). According to ISS QualityScore<sup>1</sup> data, overall female representation on boards globally reached 16.9% in 2016. In the United States, 28% of Russell 3000 boards have one-fifth of their seats held by women. In the United Kingdom, the percentage of women on FTSE 100 boards reached 28% in 2017, while only 19.4% of FTSE 100 executive committee members are women (Sealy et al. 2016). In Germany, more than 80% of non-executive board members and more than 90% of executive board members are men, while women make up 19.7% and 6.3%, respectively, in the 200 largest German companies (Holst and Kirsch 2016).

These low, albeit slowly improving, numbers persist despite an increasing number of countries having developed policies and implemented various measures to increase board diversity. Among the countries that have recently done so is Germany, where, after several discussion rounds, a gender quota was passed by the government in December 2014. Requiring the top 100 largest public traded firms to fulfil a 30% quota for their supervisory boards, the quota

✉ Marjo-Riitta Diehl  
Marjo-Riitta.Diehl@ebs.edu

Jie Huang  
jie.huang@ebs.edu

Sandra Paterlini  
sandra.paterlini@ebs.edu

<sup>1</sup> Department of Management and Economics, EBS Business School, Rheingaustraße 1, 65375 Oestrich-Winkel, Germany

<sup>2</sup> Department of Finance, EBS Business School, Gustav-Stresemann-Ring 3, 65189 Wiesbaden, Germany

<sup>3</sup> Department of Management and Economics, University of Trento, Trento, Italy

<sup>1</sup> Institutional Shareholder Services Inc. (ISS) is the world's leading provider of corporate governance and responsible investment solutions.

became effective in January 2016 (Terjesen and Sealy 2016). If the 30% quota is not fulfilled, the board seat(s) must be left vacant as a sanction. With the slow progress of gender equality, mixed results of gender quotas around the world (Terjesen and Sealy 2016; Tochia et al. 2011) and the gender equality targets of the European Commission (European Commission Web site 2018), it remains important to continue the efforts to understand the factors that hinder and promote women's leadership careers and to improve women's participation on corporate boards.

Towards this end, many scholars have been inspired to examine gender diversity in the context of corporate boards. One group of studies has investigated the relationship between the presence of women and firm or board performance (Adams and Ferreira 2009; Post and Byron 2015). These studies have focused on the outcomes of gender diversity on boards. The theoretical ambiguity and inconsistent findings have, however, indicated that this relationship is complex (Anderson et al. 2011; Carter et al. 2010; Dezsö and Ross 2012). Another body of literature has focused on the antecedents of women's appointments and considered, for example, the roles of negative biases and discrimination in the selection processes and the assessments of women for the most demanding positions, such as on corporate boards (Bilimoria and Piderit 1994; Burke 2000; Oakley 2000; Terjesen et al. 2009). This literature mainly builds on social identity theory and, more specifically, on individual demographic dissimilarity and homophily as explanations (Ibarra 1993; Joshi et al. 2011; Kanter 1977; Terjesen and Sealy 2016), arguing that men prefer men and women prefer women as colleagues. However, little systematic attention has been paid to further characteristics of boards, including the characteristics of the incumbent members of the corporate elite—that is, board members with multiple appointments.

This paper contributes to the literature examining the antecedents to women's participation in boards and advances an understanding of why women face difficulties in entering top leadership positions. Specifically, we investigate the potential influence of the incumbent elite on boards, especially men with multiple board appointments. Although gender is a salient, easily observable characteristic for individual categorisation (Kanter 1977), the interpretation of gender identities can be altered, strengthened or weakened when additional information becomes available (Stangor et al. 1992). We argue that membership on multiple boards is such an additionally salient feature of board composition. Multiple board seat holders are perceived as members of the corporate elite. They are likely to reap disproportionate benefits from this prestigious status and exercise significant influence over important corporate policies in the multiple firms where they have board seats (Domhoff 2002; Geletkanycz and Hambrick 1997; Useem 1984; Westphal and Stern 2007). Based on optimal distinctiveness theory (Brewer 1991, 2003), individuals optimise personal utility by

trading off inclusion and distinctiveness within and between social groups and situations. Membership on multiple boards implies additional benefits and signifies that the holders' distinct characteristics are worth protecting. Hence, we argue that the social dynamics related to board composition and status differences can slow women's access to top positions and merit further research.

To our knowledge, this study is the first to examine the influence of multiple appointments on women's board participation. Building on social identity theory and optimal distinctiveness theory, we test our hypotheses on a dataset of German DAX 30 firms that represent the largest publicly listed firms by market capitalisation in Germany during the period from 2010 to 2015. The findings support our two arguments; in particular, there are fewer women on boards that have men with multiple appointments, while the proportion of female board members increases with the number of incumbent female elite members (both multi-board women and C-level women, referring to women in management boards). These results are also robust in an alternative sample, increasing confidence in their stability.

With our study, we make several important contributions to the existing literature on women on boards. First, we extend the social identity theory-based explanations in gender studies by investigating the impact of elite groups on corporate boards, i.e. the presence of men and women with multiple appointments on gender diversity. Although previous research has examined the effects of demographic dissimilarity on the number of women on boards, a comprehensive theoretical explanation regarding individuals' protection of identification and the subsequent effects on board gender diversity has yet to be developed. Our work shows and explains why we can expect boards with multi-board male directors to be unwilling to appoint female directors to boards. We thus highlight the importance of status considerations in the promotion of gender diversity. Second, in line with our theorising, our findings suggest that incumbent female multiple-seat holders, as well as C-level women, promote women's appointments to supervisory boards, suggesting women's collective response to underrepresentation. Third, we advance our understanding of governments' and firms' policies and practices to deliberately appoint women to boards, as our data point to a positive impact from the recently introduced quota on gender diversity in Germany. Our findings indicate that the implications of the quota for the existing corporate elite must be carefully considered to truly benefit from it as a tool for diversity management and promotion of gender equality.

## Who Benefits and Who Pays for Women's Inclusion on Boards?

Our attempts to extend the existing answers to the questions “why are women still underrepresented in board positions?” and “what prevents gender progress?” rest on the assumption that the inclusion of women on boards is inextricably embedded in a context of competition and that it reflects the configuration of the existent norms and social forces of this context. For our argument, we specifically draw on social identity theory, which is a commonly applied theory in leadership research (Chattopadhyay et al. 2004; Joshi et al. 2011), and optimal distinctiveness theory (Brewer 1991, 2003).

According to upper echelon theory, people's cognitions, values and perceptions, which are formed by previous experiences, can significantly affect the process of strategic choices (Hambrick and Mason 1984). As Hambrick (2007) stated, “The central premise of upper echelons theory is that executives' experiences, values, and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choices ... bounded rationality [introduce] the idea that informationally complex, uncertain situations are not objectively ‘knowable’ but, rather, are merely interpretable” (Hambrick 2007, p. 334). Given that men have long held the overwhelming majority on corporate boards, the behavioural norms and the assumptions of how boards should look and function have been developed by them. According to *social identity theory*, once a person categorises and identifies himself or herself as a member of a specific group and gains both physical and psychological resources from the group membership (Hackman 1992; Tajfel and Turner 1979), the group becomes an important source of pride and self-esteem. This increases the likelihood that group members—in our case board members—are obliged and willing to conform to and protect the extant norms. The interpretation and identification processes interact. In other words, men protect the established norms according to their experience and the value of being the majority and being in control. The more strongly the members identify with and adhere to the group, the more tightly they grip the extant norms. Empirically, Boivie, Lange, McDonald and Westphal (2011) showed that CEOs who more strongly identified with the corporate elite would provide more support to their fellow CEOs.

We are specifically interested in boards with holders of multiple seats defined as individuals with more than one board appointment, because they are distinct from those who have only a single board seat in important ways. Multi-board holders are regarded as members of the inner circle or the corporate elite, and therefore they tend to hold disproportional influence over the business

world (Domhoff 2002; Geletkanycz and Hambrick 1997; Mizruchi 2004; Palmer and Barber 2001; Useem 1984; Westphal and Stern 2007; McDonald and Westphal 2013). Most multi-board holders are men; women are a minority among those holding more than one corporate board seat (Zweigenhaft and Domhoff 2006). According to optimal distinctiveness theory (Brewer 1991, 2003), distinctiveness itself is a motive that influences the selection of social groups and strengthens social identities between social groups, thereby satisfying an individual's psychological needs (Brewer 2003). Hence, distinctiveness as a motivation urges a person to differentiate herself/himself from a group's shared identity. Given that men constitute the overwhelming majority on boards, but only a few of them hold multiple board seats, we can expect multi-board men to perceive their multiple appointments as a unique resource that is worth preserving in comparison to other men as well as women. In other words, we argue that the self-identity of multi-board men is built on two characteristics that both imply a set of benefits: first, as men, and second, as men with multiple board appointments.

## Hypothesis Development

### The Impact of the Presence of Multi-Board Men on the Appointment of Women

There are several reasons why we expect boards with men with multiple appointments to protect their distinctiveness and hence oppose women's participation compared to boards with men with single board appointments. We elaborate on these reasons in the following section. First, we argue that the appreciation of women's independence as board members is likely to stimulate the vigilance of powerful men, especially those who hold multiple board appointments. Female board members are more likely to be independent than men in their decision making, largely due to their historical underrepresentation on boards. The previous literature has argued that such independence renders women likely to “excel in monitoring activities and to hold management accountable for performance more firmly than their male counterparts” (Abdullah et al. 2016, p. 468). The extant evidence shows that the presence of female board members reduces accounting manipulation, improves the informativeness of the reported accounting numbers (Abdullah et al. 2016) and decreases financial fraud (Cumming et al. 2015), tax aggressiveness (Lanis et al. 2017) and excessive CEO compensation (Bugeja et al. 2016). This effect is even strengthened through the clustering of men in “old boys' clubs” and creates what we call a “backward advantage” for women. In other words, women are better able to exercise their supervisory functions precisely because of their

shallower roots in the business world compared to those of men (Adams and Ferreira 2009). Multiple affiliations and the resulting interconnectedness within the elite of the network give access to more information and may lead to different decision-making behaviours than those of individuals without such connections (Mizuchi 2004; McDonald and Westphal 2013). As McDonald et al. (2013) suggested, “Many, if not most, of a novice director’s fellow directors will be CEOs of large corporations or other members of the corporate elite, and extant research indicates that independent control is viewed as decidedly non-normative among corporate elite members” (McDonald and Westphal 2013, p. 1172).

Second, women as a group tend to have different profiles compared to men as a group in terms of their education, occupation and skills, and as a result, their presence on boards usually increases the overall diversity of functional backgrounds (Barbulescu and Bidwell 2013). The previous literature has also suggested that women are good at establishing close relationships and creating collaborative work environments (Greguletz et al. 2018), which could change the team dynamics on boards. Women’s talent for creating consensus and for conflict avoidance can be valuable in management and leadership tasks (Dargnies 2012). At the same time, “substantial research on developed country firms acknowledges diversity as an important determinant of boards’ functioning because it connects firms to diverse external resources” (Abdullah et al. 2016, p. 468). Women—due to their diverse experience and backgrounds—can introduce complexity in terms of different “personalised interpretations” in the context of boards, thereby diverting the board from the dominant norms and threatening the group coherence. The problem of complexity might especially be an issue for boards with multi-board men because of members’ busy schedules and time commitments to each board appointment, as well as potential conflicts of interest or mutual interests stemming from decisions made at different boards. Hence, boards with multi-board men are likely to appreciate efficient communication and trust with in-group members than boards with men with single appointments and might feel a lower need to allocate time to interactions with out-group members (McDonald and Westphal 2013) due to the perceived elite status. Relatively less frequent interactions and less depth in the interactions are in turn likely to reduce the empathy for and understanding of the minority members in the group. Previous evidence has also suggested that men respond more negatively to increased group diversity than women (Wharton and Baron 1987). We can thus assume that boards with men are likely to resist female appointees to boards, despite the evidence that men have been shown to report lower levels of positive effects in homogenous teams compared to mixed groups (Chatman and O’Reilly 2004).

Third, we argue that boards with multi-board men want to protect their distinctiveness as business elites and are reluctant to appoint other board members who may challenge the status quo favourable to the group. Extant research (Davis 1993; Davis et al. 2003; Domhoff 2002; O’Neal and Thomas 1996; Useem 1984; Westphal and Stern 2007) indicates that incumbent directors who serve on other boards tend to play important roles in facilitating additional appointments for focal directors (McDonald and Westphal 2013). Social identity theory (Turner 1987; Ibarra 1993) and optimal distinctiveness theory (Brewer 1991, 2003) thereby introduce a theoretical mechanism that explains why multi-board men, in particular, might react negatively to women entering boards. Previous research argues that the more an individual appreciates the resources derived from group identity, the more that individual sees the group membership as central to his or her definition of self and the more likely that s/he is to conform and adhere to the norms that protect the group (Hackman 1992). As a distinct group that sets norms, it is in the interest of men to protect their identity and status. As Oakley (2000) explains, the “old boy network” of CEOs and corporate directors has a great deal to lose in case of an influx of new entrants. If women, however, reach top positions in large numbers, they are likely to challenge the prevailing masculine cultural norms.

Finally, McDonald and Westphal (2013, p. 1170) further note that “holders of multiple board seats are also more likely to be named to prestigious advisory bodies such as the Business Roundtable that give an individual still wider influence in corporate affairs. Holders of multiple directorships are also more likely to receive prestigious and influential positions in other main societal spheres (outside the corporate sector), such as appointments to boards of prominent non-profit organisations and governmental advisory boards”. Because these benefits are largely derived from the high status associated with multiple appointments, multi-board men are likely to consider women important competitors for additional board seats. Recent empirical evidence suggests that cross-boarding women are those who are likely to receive an additional board appointment (Ridgeway and Correll 2000; Ding et al. 2013), that is, the number of multi-board women is increasing. Once women start to be appointed to more than one board, men may attempt to protect their “distinctiveness” by blocking the entry of women to boards in the first place. Our theoretical perspective thus addresses the potential role that men with multiple board appointments might play in efforts against women’s appointments as these erode multi-board men’s monopoly status.

Taken together, the arguments above lead to the first prediction:

**Hypothesis 1** The number of men with multiple appointments on a given board is negatively related to the level of the board's gender diversity.

### The Impact of the Presence of Women on the Appointment of Further Women

We further argue that boards are likely to include more women to the extent that there are already women with multiple appointments on the board, especially under the prevalent societal stereotypes of female leaders. Gender stereotypes are widely shared beliefs about the characteristics of men and women, which create expectations about “what women are like (descriptive)” and “how they should behave (prescriptive)” (Heilman 2001, p. 657). Men are commonly thought to possess achievement-oriented traits, also referred to as *agentic* traits, whereas women are believed to possess socially oriented traits, also referred to as *communal* traits (Dennis and Kunkel 2004; Heilman 2001; Schein 2001). This greater attribution of agentic qualities to men puts women at a disadvantage when aspiring to high-status positions, as these are highly associated with and require male-stereotypic agentic attributes (Bongiorno et al. 2014; Powell et al. 2002). As a result, women in board positions may experience role conflict and extra burdens because of the conflict between female stereotypes and the board position associated with power, authority and control, which are attributes that are typically perceived as masculine (Eagly and Carli 2007). This double bind may, however, help us explain why boards with women with multiple appointments are likely to further encourage women's board memberships.

As mentioned earlier, social identity theory and the similarity–attraction paradigm (Byrne 1971; Turner 1987; Schneider 1987) have been the dominant theoretical frameworks in the study of gender diversity. Previous research has suggested that the similarity among individuals leads to liking and attraction (Joshi et al. 2011). We know from previous studies that people are comparatively more willing to help in-group members than out-group members (Levine et al. 2005; Simon et al. 2000) because of greater empathy for in-group members (Maner and Gailliot 2007) and the “similarity–attraction” effect (Byrne 1971; Montoya and Horton 2004). Such in-group empathy and attraction are also likely to result in an enhanced willingness to help (Chattopadhyay et al. 2004; McDonald and Westphal 2013). For example, female board members are “particularly effective in connecting firms with resources controlled by women and in helping them to attract and retain female employees” (Abdullah et al. 2016, p. 468). Hence, incumbent female board members are likely to view female candidates as in-group members due to gender and will show greater willingness to help them.

Second, we expect multi-board women to be especially keen on providing support to other women. As a minority yet an elite, they represent the female group, and they are forced to compete for the members of their group to gain and maintain their self-esteem and status and to increase their power (Chatman and O'Reilly 2004). The support within a group is not only a matter of competing for resources, such as positions, but it is also an attempt to enhance the group identity and elite status. Such social identity enhancement strategies occur when a minority that receives inferior treatment on the basis of its demographic category (Martin 1981) strives to improve the status of its category (Chattopadhyay et al. 2004). Because the “category” is evaluated by a status-relevant quality (Tajfel and Turner 1986; Terry and Callan 1998), a strategy that changes a collective status is worth promoting (French 2001). Once the status of the “category” has been enhanced by acknowledging status-relevant qualities, individuals belonging to the category improve their social identity and receive marginal payoffs. We acknowledge that such argumentation challenges the Queen Bee phenomenon, which refers to women who pursue individual success in male-dominated work contexts by adjusting to the masculine culture and distancing themselves from other women (Kanter 1977; Staines et al. 1974). Based on optimal distinctiveness theory (Brewer 1991, 2003), women might trade-off between the utility increase accompanied by the enhancement of collective identity towards men in general and the utility increase based on distinguishing themselves from other women. We accept the premise that women may be willing to include other women until the threshold at which the first benefit (collective identity enhancement) is less than the second benefit (individual distinctiveness). Because we have only a few women on boards so far—and even fewer women with multiple appointments—marginal collective benefits are still bound to exceed the potential marginal individual benefit for a long time.

Although a qualified woman might face extreme difficulties when progressing towards her first top position, once she overcomes the threshold, the first entry becomes a strong certification of her quality. This certification effect causes women to become more likely to be appointed to further boards than men under the current pressures (arising from quotas) to include more women on boards (Ding et al. 2013). As we previously argued, there are reasons to assume that multiple status categories might operate simultaneously among board members. Ridgeway and Correll (2000) argued that “other” identities, particularly those based on institutional roles (corporate boards), can significantly influence evaluation and selection processes, indicating that, in certain situations, the visible qualification or affiliation can buffer against gender-based assumptions of competence. Entry to a board position is therefore an important and valuable means for women to enhance their social identity. Incumbent

female multi-board holders helping other women to obtain board positions also boost the collective group status, which benefits themselves ultimately. Therefore, we expect that the presence of women with multiple board appointments will alleviate the negative effects of female status on receiving a board appointment. Hence, we hypothesise the following:

**Hypothesis 2** The number of women with multiple appointments on a given board is positively related to the level of the board's gender diversity.

### The Impact of C-Level Women on the Further Appointment of Women to Boards

As mentioned above, in many societies, powerful women experience a double bind in terms of gender and leader stereotypes (Eagly and Carli 2007). Such societal perceptions often bias the judgement of the actual performance of women (Lee and James 2007) and thus increase the perceived risk associated with their appointments (Lubomir et al. 2012). The scarcity of female board members on the current board accentuates the perception of the risk associated with new appointments. However, from the demand side, the characteristics of firms and their boards determine the likelihood of appointing women and the criteria used in their selection. The characteristics also shape the corporate environment in which female board members operate and women's ability to influence boards' functioning and firms' performance. On the one hand, the presence of C-level women can reflect a positive perception and attitude towards female leaders in the company and among its stakeholders. Boards of such firms could benefit more from women's independence and diversified resources in the first place and could have lower costs in further pursuing gender parity. On the other hand, as opposed to the work of supervisory board members, such as monitoring, providing consultants and attending annual meetings, the work of a management board is more operational and intensive.

Therefore, first, those firms with women on their management boards might endogenously generate the need for female leaders. Second, strong pressure to conform to gender parity policies further favours the impact of female chief officers (women on management boards) on women's inclusion. We argue that this results in a greater prevalence of female directors on supervisory boards, especially if a female chief officer favours members of her own gender group. Thus, the presence of women in top management reflects a firm's characteristics and openness. Consequently, the presence of female management board members is likely to have a positive impact on gender diversity on the supervisory board. Formally,

**Hypothesis 3** The presence of women on management boards is positively related to the level of board gender diversity.

## Methodology

### Sample and Context

The empirical testing is based on the boards of the thirty (30) companies that comprised the DAX 30 index on 15 August 2015. They are the thirty largest firms for market capitalisation in Germany. European countries, such as Germany, have been actively promoting women's participation in business since "the Strategy for Equality between Women and Men" was initiated by the European Commission in 2010. Germany provides an interesting context for our study because it was among the latest countries to introduce a gender quota of 30% on supervisory boards, effective starting 1 January 2016, which is, therefore, still not binding for the boards in our sample, as we consider the period 2010–2015. The decision to implement the quota in Germany was made in 2014. As Table 2 shows, the number of women on German boards has almost doubled from 64 in 2010 to 121 in 2005. The number of multi-board women has also steadily increased over time, while the number of multi-board men has decreased.

In terms of corporate governance, German firms follow a two-tier system with the supervisory board and management board split. The supervisory board is in charge of monitoring, supervising and appointing the management board, which is responsible for firm operations. The size of the supervisory board depends on firm size, and the supervisory board members include directors elected by both shareholders and employee representatives; large publicly traded firms (with > 2000 employees) are required to allocate at least 50% of their supervisory board seats to employee representatives. Furthermore, ownership in Germany is fairly concentrated. A large proportion of shares are held by large block holders, such as banks, other large firms and founding families (Gedajlovic and Shapiro 1998). Stock-based incentive pay to top managers is implemented less frequently than, for example, in U.S. firms (Tuschke and Sanders 2003).

### Data Collection

We collected our data from annual reports and from Datastream (for firm-level performance indicators). Because our dataset is from 2010 to 2015 (before the binding date for the quota in Germany), we also control for the year

effect, as we expect the number of women on boards to increase over time in anticipation of the quota.

### Dependent Variable

**Board Diversity (BoardDiversity)** We use Blau's index to measure the extent to which the supervisory board is diversified. Blau's heterogeneity index is considered to be one of the most appropriate and most commonly used measures of board diversity. The Blau's heterogeneity index (Blau, 1977) is computed based on the proportion of each gender group as follows:

$$\text{Blau's Heterogeneity} = 1 - [P_m^2 + P_w^2],$$

where  $P_m$  and  $P_w$  are the proportions of men and women, respectively. Then, a fully diversified board comprised half by men and half by women has a heterogeneity measure of 0.5, as  $P_m = 0.5$  and  $P_w = 0.5$ , while a non-diversified board ( $P_m = 1$  or  $P_w = 1$ ) has a value equal to 0. For each company in our sample, we then compute the corresponding Blau's heterogeneity index.

### Independent variables

**Number of Multi-board Men (NMultiBoardMen)** Multiple board holders are those directors with more than one board seat; thus, they are situated in a harbour affiliated with multiple firms. They can have more influence on the board's strategic decisions than single board holders due to their access to a larger information set, connections to a pool of board members and their elite status.

**Number of Multi-board Women (NMultiBoardWomen)** Because multiple appointments can compensate for female directors' legitimacy problem and make them more influential to firm strategic decisions, such as those regarding diversity, we include the number of multi-board women in our analysis to observe the impact from women's side.

**Presence of Women on the Management Board (PresenceWomenMgmt)** We include a binary variable to indicate the presence of women on management boards. Because the work responsibilities are totally different for management boards compared to supervisory boards, female director(s) on management boards, being more involved in the focal firm, could have impacts on board diversity.

### Control Variables

**Men's Average Degree of Centrality** We use degree of centrality, a count of the number of links directed to the node of the network/board member, to control for individual power in the interlocking corporate networks. For each man on each board, we compute the degree centrality and then compute the average for each board. Because we are interested in men's impact on board gender diversity, except for our central explanatory variable—the number of multi-board men, the degree centrality of the male group, a social network measure<sup>2</sup>, can help to control for the overall impact of the majority group, including the single board men.

**Firm Size** We use the logged value of the number of full-time employees to indicate firm size.

**Firm Performance** EBIT (earnings before interest and taxes) and ROA (return on assets) are included in the firm's profitability and performance. The majority of research on diversity focuses on the relationship between women's inclusion and firm performance to investigate the possible influence that women might have on a firm. It is important to control for a firm's profitability and performance because they are crucial factors concerning a firm's diversity strategy (Post and Byron 2015; Hillman et al. 2007).

**Firm Market Price Volatility** We use a firm's market price volatility to capture its market risk. Because including female directors is still perceived as an uncertain and risky move for most market participants, the market risk dimension is an important determinant of board diversity strategy.

**Firm Ownership Concentration** We calculate the ownership concentration as the sum of percentages of shares held in a block of at least 5% (Tuschke and Sanders 2003). The percentage of shares held by the largest owner is also calculated and used as a robustness test. The results showed no difference using these two measures.

**Board Size** We use the number of board members for the board size (Farrell and Hersch 2005; Adams and Ferreira 2009). Board size is potentially related to gender diversity in the boardroom, and it is another important measure to capture board independence apart from ownership concentration.

**Foreign Sales to Total Sales** Foreign sales are included to reflect the extent to which a firm is diversified in dimensions other than gender diversity.

<sup>2</sup> Bonacich power (beta centrality) centrality, another centrality measure in social network analysis, is also used for robustness checks (Bonacich 1987).

**Table 1** Summary statistics on individual characteristics

Variable	Obs.	Mean	Median	SD	Min	Max
Multiple boards						
Age	315	61.07	62	7.15	45	77
Education	315	0.68	1	0.47	0	1
Major	230	0.20	0	0.40	0	1
Nationality	306	0.89	1	0.31	0	1
Male						
Age	280	62.09	63	6.71	45	77
Education	280	0.68	1	0.47	0	1
Major	205	0.22	0	0.41	0	1
Nationality	271	0.90	1	0.30	0	1
Female						
Age	35	52.91	52	5.10	45	63
Education	35	0.69	1	0.47	0	1
Major	25	0.08	0	0.28	0	1
Nationality	35	0.83	1	0.38	0	1
Single board						
Age	3156	55.37	55	7.69	25	88
Education	3399	0.35	0	0.48	0	1
Major	1408	0.24	0	0.43	0	1
Nationality	2615	0.81	1	0.40	0	1
Male						
Age	2642	55.78	55	7.82	25	88
Education	2827	0.37	0	0.48	0	1
Major	1198	0.25	0	0.43	0	1
Nationality	2182	0.81	1	0.39	0	1
Female						
Age	514	53.25	52	6.60	40	74
Education	572	0.25	0	0.43	0	1
Major	210	0.19	0	0.39	0	1
Nationality	433	0.79	1	0.41	0	1

*Age* is the difference between the observation year and the birth year. *Education* is coded as 1 if a person has a *doctorate* or *MBA*; otherwise, it is coded as 0. *Major* is coded as 1 if a person has studied the following fields: *Mathematics, Physics, Chemistry, Science, Engineering* and *Computer Science*; it is coded as 0 if a person has studied the following fields: *Business, Finance, Accounting, Economics, Management, Journalism, Law, Literature, Language, Politics* and *Philosophy*. *Nationality* is coded as 1 if a person was born in Germany; otherwise, it is coded as 0

## Our Model

To estimate the effect of incumbent corporate elites on board diversity of gender, we need to allow for firm heterogeneity. Thus, for the sample of 30 firms over a span of 6 years, a fixed effects model is used to estimate the regression parameters. The models we consider can be expressed as follows:

$$\begin{aligned}
 \text{BoardDiversity}_{it} = & \alpha + \beta_1 * \text{NMultBoardMen}_{it} \\
 & + \beta_2 * \text{NMultiBoardWomen}_{it} \\
 & + \beta_3 * \text{PresenceWomenMgmt}_{it} \\
 & + \gamma * \text{ControlVariables}_{it} + \varepsilon_{it} \\
 & \text{for } i = 1, \dots, 30, t = 1, \dots, 6,
 \end{aligned}$$

where board diversity is the Blau's heterogeneity index with respect to gender for a certain board, and  $\varepsilon$  is the error term. All the variables are calculated for each board-year observation. Therefore, the analysis is on variables defined at the board level.

In total, we estimate five models: Model 1 includes only the control variables; Model 2 includes the number of multi-board men as an explanatory variable; Model 3 further includes the number of multi-board women and the binary variable—women in management; Model 4 includes year effects and Model 5 replaces year effects with time pressure, which is generated as the inverted difference between the years (2010–2015) and 2016 to



**Table 2** The yearly distribution of the holders of multiple board seats

Board holding	Year					
	2010	2011	2012	2013	2014	2015
Single	554	566	593	565	561	560
Multiple	59	55	46	48	52	55
	10.65%	9.72%	7.76%	8.50%	9.27%	9.82%
<b>Male</b>						
Single	490	492	494	460	452	439
Multiple	57	52	43	42	42	44
	11.63%	10.57%	8.70%	9.13%	9.29%	10.02%
<b>Female</b>						
Single	64	74	99	105	109	121
Multiple	2	3	3	6	10	11
	3.13%	4.05%	3.03%	5.71%	9.17%	9.09%

**Table 3** Summary statistics of the main variables

Var.	Mean	Median	SD	Min	Max
Board diversity (Blau)	0.23	0.23	0.12	0.00	0.46
No. of multi-board men	3.71	4.00	2.00	0.00	9.00
No. of multi-board women	0.43	0.00	0.65	0.00	3.00
Women in mgmt. (0/1)	0.31	0.00	0.46	0.00	1.00
Men's average degree	31.29	31.68	8.19	15.00	52.80
Board size	23.02	23.00	4.73	14.00	31.00
Firm size	126.91	79.02	130.36	3.49	626.72
EBIT	3554.63	2365.50	3966.60	-4893.00	26890.00
ROA	0.04	0.04	0.04	-0.11	0.23
Market price volatility	5.42	4.50	5.85	0.41	65.63
Largest ownership	0.20	0.16	0.17	0.00	0.89
Foreign sales to total sales	64.47	68.58	20.09	6.62	100.00

account for the quota pressure increasing while getting closer to its effective binding requirement.

## Results

For an overview of the individual characteristics, we separate the sample depending on whether an individual holds multiple board seats, and then, we further group the subsamples by gender. As reported in Table 1, multiple board holders are, on average, 6 years older, are more likely to have doctorate or MBA educational experience, are slightly less likely to have studied in scientific field and are more likely to hold a German passport than an international passport. When focusing on differences between male and female multiple board holders, we found that men are, on average, almost 10 years older than women; 22% of men have scientific backgrounds compared to 8% of women and women are slightly more international than men (that is, they originate from outside Germany).

Multi-board men are also, on average, 7 years older than single board men, possibly suggesting the existence of a so-called "old boys' club", in which age and multi-board status are characterising attributes.

Table 2 shows the distribution of board membership of single boards and multiple boards from 2010 to 2015. We see that both single and multiple board seats remain dominated by men. However, the percentage of multiple seats holders and single seat holders is stable at approximately 10% for the male group, and it sharply increased from 3% to almost 10% for the female group, showing that women are catching up by having a larger proportion of multi-board holders in their gender group. We also note that the number of single board women grew from 64 in 2010 to 121 in 2015. Women have thus almost doubled their presence on boards. Graphically, as Fig. 1 shows, the overall number of men's board seats decreased, while that of women increased (Tables 3, 4).

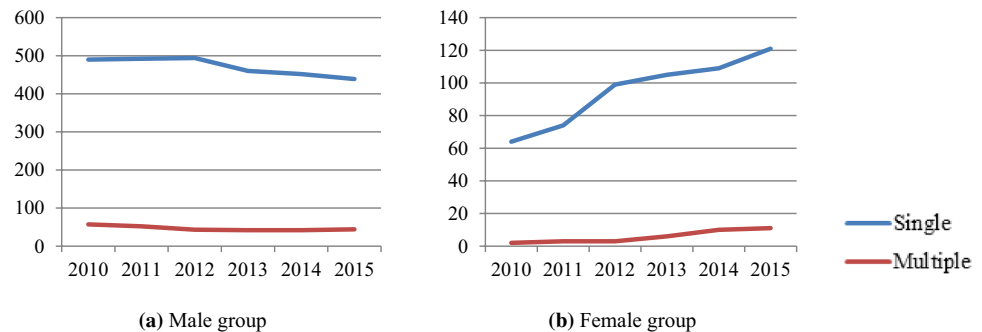
As shown in Table 5, some items correlate highly with a maximum of 0.779 for men's average degree and number of

**Table 4** Distribution of multi-board membership

No. of multi-board men on boards	0	1	2	3	4	5	6	7	8	9	Total
No. of boards	9	14	34	28	30	27	26	8	1	3	180
No. of multi-board women on boards	0	1	2	3	4	5	6	7	8	9	Total
No. of boards	118	48	13	1	0	0	0	0	0	0	180

In our sample of DAX30 firms from 2010 to 2015, only 9 year-firm observations are without multi-board men, and 3 observations have 9 multi-board men on their boards. In contrast, most observations—118 out of 180—are without female multiple board seat holders, and we only found one board with 3 multi-board women in a single year

**Fig. 1** The yearly distribution of the holders of multiple boards. *Note* Due to the enormous difference between the numbers of board members in the two gender groups, the scales are not adjusted for ease of reading



multi-board men. This outcome is as expected, given that appointment to multiple boards allows for connecting the person with a larger set of board members. Nevertheless, we test the variance inflation factors (VIFs), and the results exclude the presence of multicollinearity among the independent variables. Furthermore, for model specification, Hausman test was performed, rejecting the null hypothesis  $H_0$  that the random effects model is preferred to the fixed effects model. Therefore, a fixed effects setting is implemented for our analysis.

Table 6 reports our main regression results for the DAX 30 dataset in the period of 2010–2015. Blau's heterogeneity index, indicating board diversity, is the independent variable for all five models. Model 1 includes only the control variables; Model 2 includes the number of multi-board men as an explanatory variable; Model 3 further includes the number of multi-board women and the binary variable—women in management; Model 4 includes year effects and Model 5 replaces year effects with time pressure. The observation number of 170 is due to the missing value of ROA and foreign sales<sup>3</sup>.

<sup>3</sup> The reason why we have only 170 observations is the following: ROA data are missing for Commerzbank AG in 2010 and 2013, for Deutsche Bank AG in 2015 and for Fresenius Medical Care AG and Co KGaA in 2013 (altogether 4 missing observations). Further, foreign sales data are missing for Linde AG for all the sample years (altogether 6 missing observations). In total, 10 observations out of 180 are missing.

**Hypothesis 1** Hypothesis 1 states that boards with more multi-board men are less diversified. The negative and significant coefficients of the number of multi-board men across Models 2–5 support the hypothesis:  $\beta = -0.570$  ( $p < 0.01$ ) in Model 2;  $\beta = -0.306$  ( $p < 0.01$ ) in Model 3;  $\beta = -0.171$  ( $p < 0.10$ ) in Model 4 and  $\beta = -0.268$  ( $p < 0.01$ ) in Model 5. The negative estimates are indicative of the adverse/negative pressure from powerful men in German firms towards female candidates for board positions. The majority of multi-board holders in Germany are men; however, more than 30% of the firms that we consider have women on their management boards, despite five of 30 firms having more than one woman (Table 3).

**Hypothesis 2** Hypothesis 2 argues that boards with more multi-board women are more diversified, suggesting that boards with elite corporate women exercise positive pressure to further increase gender diversity. The positive and significant coefficients in Models 3–5 confirm our second argument  $\beta = 0.328$  ( $p < 0.01$ ) in Model 3;  $\beta = 0.173$  ( $p < 0.01$ ) in Model 4 and  $\beta = 0.199$  ( $p < 0.01$ ) in Model 5. These findings suggest that although boards with multi-board male directors, to some extent, restrain female directors' participation, boards with multi-board female directors welcome further female fellows. It is in turn indicative of favourable views of fellow women by women in powerful positions. Furthermore, the presence of women on management boards is strongly significant ( $p < 0.01$ ) across models 3–5, with  $\beta = 0.819$  in Model 5. The positive coefficients provide support for Hypothesis 3.

Table 5 Pearson's coefficient matrix

	Board diversity	No. of multi-board men	No. of multi-board women	Women on mgmt. board (0/1)	Men's average degree	Firm size	EBIT	ROA	Market price volatility	Largest ownership	Foreign sales to total sales
Board diversity	1										
No. of multi-board men	-0.076	1									
No. of multi-board women	0.442***	0.121	1								
Women on mgmt. board (0/1)	0.509***	0.133*	0.361***	1							
Men's average degree	0.291***	0.779***	0.279***	0.303***	1						
Firm size	0.043	0.401***	0.229***	0.276***	0.497***	1					
EBIT	0.039	0.234***	0.295***	0.290***	0.403***	0.494***	1				
ROA	-0.062	-0.359***	-0.074	0.069	-0.395***	-0.054	0.135**	1			
Market price volatility	-0.161**	-0.058	0.040	-0.010	0.096	0.176***	0.156**	-0.025	1		
Largest ownership	-0.174**	-0.189**	-0.084	-0.064	-0.243***	0.088	-0.144**	0.133**	-0.107*	1	
Foreign sales to total sales	-0.242***	-0.366***	0.021	0.035	-0.342***	0.101	0.0530	0.325***	0.140**	0.164**	1
Board size	0.348***	0.411***	0.255***	0.343***	0.746***	0.512***	0.455***	-0.314***	0.204***	-0.001	-0.198***

**Table 6** Regression results of DAX30 (2010–2015)

	(1)	(2)	(3)	(4)	(5)
No. of multi-board men		−0.570*** (0.135)	−0.306*** (0.100)	−0.171* (0.100)	−0.268*** (0.093)
No. of multi-board women			0.328*** (0.052)	0.173*** (0.056)	0.199*** (0.054)
Women on mgmt. board (0/1)			0.854*** (0.111)	0.748*** (0.107)	0.819*** (0.102)
Men's average degree	−0.513*** (0.173)	0.183 (0.232)	0.236 (0.169)	0.203 (0.155)	0.256 (0.155)
Firm size	2.140*** (0.654)	2.090*** (0.617)	1.337*** (0.451)	0.415 (0.444)	0.645 (0.437)
EBIT	0.096 (0.114)	0.041 (0.109)	−0.103 (0.081)	−0.032 (0.076)	−0.055 (0.075)
ROA	−0.113 (0.105)	−0.051 (0.100)	−0.100 (0.073)	−0.060 (0.068)	−0.081 (0.068)
Market price volatility	0.028 (0.111)	−0.008 (0.105)	−0.055 (0.076)	−0.058 (0.074)	−0.103 (0.070)
Largest ownership	−0.063 (0.109)	−0.004 (0.104)	−0.129* (0.076)	−0.079 (0.070)	−0.103 (0.070)
Foreign sales to total sales	0.035 (0.131)	−0.025 (0.124)	−0.045 (0.090)	0.025 (0.084)	−0.007 (0.083)
Board size	0.085 (0.192)	−0.017 (0.183)	−0.271** (0.134)	−0.130 (0.126)	−0.178 (0.125)
Year_2010				−0.696*** (0.135)	
Year_2011				−0.631*** (0.123)	
Year_2012				−0.469*** (0.122)	
Year_2013				−0.332*** (0.111)	
Year_2014				−0.190* (0.106)	
Time pressure					0.676*** (0.135)
Constant	−0.011 (0.049)	−0.011 (0.047)	−0.247*** (0.047)	0.173* (0.093)	−0.513*** (0.069)
Observations	170	170	170	170	170
R <sup>2</sup>	0.166	0.265	0.624	0.703	0.685

Standard errors in parentheses

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$

In Models 4 and 5, the impact of firm-level measures on board diversity becomes insignificant with the introduction of time effects, suggesting that the impact is captured via time effects, such as ownership concentration, firm size and board size. Moreover, the decreasing coefficients on the year effects [from  $-0.696$  ( $p < 0.01$ ) for 2010 to  $-0.190$  ( $p < 0.10$ ) for 2014] and the positive coefficient of the pressure variable ( $0.676$  ( $p < 0.01$ )) time pressure in Model 5) support our anticipation that board diversity increases as the binding date of the gender quota policy in Germany approaches.

We conducted additional tests with alternative measures of our main explanatory variables to examine the robustness of our conclusions—replacing the number of multi-board men with dummy variables (in Table 7, Dum0 = 1 indicates that the boards have at least one multi-board man, Dum1 = 1 indicates that the boards have at least two multi-board men and so on until Dum8 = 1 indicates that the boards have at least 9 multi-board men). The significant coefficients in Models 1 and 2 ( $-0.468$  ( $p < 0.10$ ) in Model 1 and  $-0.461$  ( $p < 0.05$ ) in Model 2) and the insignificant coefficients in Models 3 through 9 shown in Table 7 further confirm our argument that the presence of multi-board men has important effects on board diversity. In Model 1, we set the dummy variable (Dum0) to indicate whether boards

have multi-board men. The results show that boards with multi-board men (regardless of how many) have lower levels of gender diversity. In Model 2, we set the dummy variable (Dum1) to one if a board has at least two multi-board men. The result shows that boards with more than two multi-board men are less diversified than boards with none or only one multi-board man. In Model 3, we regroup the sample according to the number of multi-board men with different thresholds. The insignificant results indicate that when the threshold is larger than 3 for setting the dummy variable, there are no differences between two groups with different numbers of multi-board men, suggesting that multi-board men play crucial roles in board diversity, and even for boards with small numbers of such men (at least two), we observe a noticeable negative impact on board diversity. Moreover, there are minor changes in the magnitude of other coefficients, but the general conclusions hold consistently with these modified specifications.

For robustness, to evaluate whether results would continue to hold when considering a larger share of companies characterising the German economy, we also build a dataset of the 160 largest German firms in 2017 (included in the DAX, MDAX and SDAX indices). “Appendices A1–A3” show that, compared to DAX 30, this dataset has a higher level of board diversity, while it has fewer multi-board men

**Table 7** Dummies for the number of multi-board men

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dum0	-0.468* (0.275)								
Dum1		-0.461** (0.213)							
Dum2			-0.171 (0.127)						
Dum3				-0.181 (0.127)					
Dum4					0.142 (0.134)				
Dum5						0.111 (0.126)			
Dum6							-0.175 (0.160)		
Dum7								-0.160 (0.257)	
Dum8									-0.149 (0.300)
No. of multi-board women	0.186*** (0.0566)	0.162*** (0.0562)	0.178*** (0.0565)	0.177*** (0.0564)	0.186*** (0.0576)	0.176*** (0.0567)	0.177*** (0.0566)	0.177*** (0.0569)	0.176*** (0.0569)
Women in mgmt. (0/1)	0.756*** (0.106)	0.803*** (0.108)	0.763*** (0.107)	0.733*** (0.108)	0.781*** (0.110)	0.767*** (0.108)	0.772*** (0.108)	0.764*** (0.108)	0.761*** (0.108)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.599** (0.264)	0.580*** (0.207)	0.306** (0.133)	0.272** (0.114)	0.115 (0.112)	0.153 (0.0985)	0.177* (0.0937)	0.174* (0.0943)	0.174* (0.0946)
Observations	170	170	170	170	170	170	170	170	170
R <sup>2</sup>	0.703	0.707	0.700	0.700	0.698	0.697	0.698	0.697	0.696

Dum( $x$ ) is the dummy variable, for which the boards with fewer than  $x$  multi-board men are coded as 0, and others are coded as 1

Standard errors in parentheses

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$

on each board. The board size is smaller than that of the DAX 30 firms, but the ROA is much higher (see “Appendix A1”). Germany has a large number of family-owned firms, the so-called *Mittelstand*, which enter MDAX and SDAX indices and might explain the different characteristics from DAX 30. The only significant coefficient is that of Dum0, indicating whether a board has multi-board men. It reveals that the effect of multi-board men on board diversity can become stronger in smaller boards than in larger ones (DAX 30 firms) such that the presence of even one multi-board man can exert sufficient influence on board diversity. The comparative data for 160 German firms enable us to evaluate our findings in a broader perspective and to examine the validity of our findings beyond DAX 30 firms (Table 7).

## Discussion

This paper examines the impact of board composition on women's participation in supervisory boards. This topic is an important field of study because men with multiple board seats form a corporate elite that not only enjoys disproportionate benefits but also has a noticeable influence on corporate decisions, including those influencing gender diversity in the corporate world. Much of the extant research conducted on the antecedents to women's access to boards has thus far treated women's inclusion as a macro-level issue and pointed out how various organisational and societal predictors influence the access of women to boards (Hillman et al. 2007). Our work refines this strand of study by arguing that, except for institutional factors, the presence of women on boards can be directly influenced by board composition

based on the identification processes of board members. We consider women's participation to reflect a firm's general demand for gender diversity, and thus it serves as an indication of the magnitude and motivation of the existing board members to include women. Therefore, we argue that the degree of gender diversity of a board reveals the prevailing attitudes towards women in a firm, especially among the members of the focal board.

We found that in boards with multi-board men, gender diversity is lower, while boards with multi-board women appear to be supportive of the appointments and the presence of more female members. Similarly, in companies with more C-level women, we find more women on boards. These different results for the two gender groups are informative regarding the ways in which powerful directors affect a firm's gender diversity strategy. They also provide support for our arguments for the applicability of social identity theory and optimal distinctiveness theory to extend our explanations for gender diversity on boards.

Social identity theory and optimal distinctiveness theory provide the underlying explanatory mechanism for our findings: we argued that men protect their own "superior" identity as male and as members of elite (as indicated by multiple board appointments). Hence, boards with multi-board men are unfavourable towards women's inclusion on boards. Critical mass theory suggests that the number of female directors must reach a certain threshold to exert a meaningful influence (Kogut et al. 2014; Joecks et al. 2013). On the one hand, although only a few of the firms in our sample pass the suggested threshold—three women on the board—, our results show that women that attain board positions are able to have a significant impact on board diversity, even in small numbers, such as one or two. On the other hand, previous studies have suggested that board participation requires women to be more competitive and qualified than men to compensate for gender stereotyping in board appointments (Ding et al. 2013). Our findings, however, suggest that women's accomplishments might paradoxically become their hindrance because they threaten the self-identity of the existing corporate elite (men, especially those with multiple appointments). Therefore, to effectively benefit from the presence and inclusion of women, we must also consider the potential conflict of interest between women and men and the redistribution of the benefits that were available for the corporate elite.

Our study makes important contributions to the literature regarding women on corporate boards. First, our study contributes to the existing understanding of women on boards by identifying a theoretical mechanism based on social identity theory and optimal distinctiveness theory to explain women's appointment to boards. Much extant research on the underrepresentation of women in board positions has focused on the role of negative biases in

assessment of women's inferior executive knowledge and experiences (Burke 2000; Oakley 2000) and the related idea of the "pipeline to the top" (Helfat et al. 2007; Terjesen et al. 2009). We approached the issue from a different angle. Our theoretical perspective suggests that stereotypes and negative biases are not necessarily based on the perceived lower quality of a minority group member or gender as such, but rather it could be the opposite: his or her unique quality and resources that s/he has can pose a threat to the identity of incumbent members. As women's inclusion and presence on boards can potentially erode the monopoly value possessed by men and especially by multi-board men, male-dominated boards may delay women's appointments. Hence, we need to consider the social dynamics and the perspective of the existing elite when developing the means to address gender inequality in the corporate world.

We hence argue, on the basis of our findings and theoretical reasoning, that the independence and diversified resources that women possess appear to trigger a sense of concern among men. In so doing, we provide a novel explanation for the difficulties that women face in entering corporate boards and achieve the elite status and that underlie the persistent underrepresentation of women with reference to those who hold multiple corporate board seats.

Second, our theorising further suggests how we can improve the progress of gender diversity through women's collective efforts. Therefore, our results also lend support for the effectiveness of quotas in promoting gender diversity, while reaching a critical mass appears to create positive group dynamics that promote diversity. Namely the homophily preference not only leads to empathy, ease of communication or emotional comfort, but it seems that women on boards (and leadership positions in general) are able to realise more benefits when the minority (female) group grows. In other words, the average utility of the group is enhanced because the value that has been "exploited" by the majority group disappears with the increase in the diversity of the board. Hence, our argumentation and results challenge the Queen Bee phenomenon, according to which powerful women might distance themselves from less successful women and refrain from supporting their female colleagues and superiors (Kanter 1977; Staines et al. 1974). Perhaps the Queen Bee phenomenon is simply a result of a threatened self-identity *when* there are few women around, as was recently proposed by Derks et al. (2016). In such contexts, in which general gender bias truly hampers opportunities for women but women still believe in *individual* opportunities, Queen Bee responses may present a temporary strategy for career advancement. In line with this suggestion, our results indicate that the increase of women in top positions enhances the self-identity of women (as a group), while the positive self-identity derived from the high status of a board member might also buffer against the development of the

Queen Bee phenomenon. It can also be that the increased attention to gender issues and multiple attempts to improve gender diversity has built momentum whereby women see value in collective efforts to make a difference. Towards this end, recent evidence from Germany also indicates that board-level gender diversity starts to positively affect firm performance *only* after a “critical mass” of approximately 30% women has been reached compared to completely male boards (Joecks et al. 2013).

### Limitations

The non-significant results of most firm-level control variables might be interpreted as suggesting that women are likely to be appointed to boards with fewer powerful men, at least in Germany. Perhaps such firms also have a diversity strategy in place and are thus more aware of and concerned about both the ethical aspects and the business case of women's inclusion. Nonetheless, the findings are in agreement with the premises of social identity theory in the contexts of gender and board diversity. However, it could also be an issue of the endogeneity of firm-level attributes and board gender diversity. Although it is beyond the scope of our paper, the theme deserves further investigation in the future to understand the important role of organisational characteristics in defining board gender diversity.

### Practical Implications

Our study also has practical implications for corporate governance and board effectiveness. Given the evidence discussed earlier, women tend to be better qualified for serving on boards because of their independence and high qualifications, together with evidence that female directors who receive one seat are more likely to receive additional board appointments, breaking the “door-keeper” effect of multi-board men could have important implications for the effective functioning of corporate boards and the promotion of gender diversity. Accordingly, progress in board diversity could potentially enhance board effectiveness, provided that the prevailing board norms adjust to encourage equally diverse contributions to decision making and corporate governance. Our study thus suggests that policies such as binding quotas have obvious, positive effects on the progress of gender diversity, even if we acknowledge the debates associated with the implementation of quotas (Terjesen and Sealy 2016).

### Conclusion

Our study takes us a step forward in explaining the underlying dynamics of gender inequality in corporations and the reasons for women's long and difficult road to top-level leadership positions. Gender diversity is an issue of ethics and justice (Terjesen and Sealy 2016; Carrasco et al. 2015), and it affects both board monitoring and the provision of resources and therefore the overall utility of firms. We show that, from the perspective of the individuals concerned, the inclusion of women on boards influences the distribution of benefits among board members, which can hurt the monopoly status and benefits of the current dominant group. Further study is still required to more fully understand the antecedents to board gender diversity and the social forces involved to further press the progress in gender equality.

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### Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

### Appendices

#### Appendix A1: Summary Statistics for 160 German Firms in 2017

Variable	Mean	Median	SD	Min	Max
Board diversity (Blau)	0.32	0.38	0.15	0.00	0.50
No. of multi-board men	1.17	1.00	1.46	0.00	6.00
No. of multi-board women	0.37	0.00	0.67	0.00	3.00
Men's average degree	12.57	11.00	7.45	2.00	33.14
Firm size	36.52	7.44	83.99	0.00	626.72
EBIT	986.43	186.19	2292.90	-4893.00	12893.00
ROA	5.31	5.32	5.59	-14.78	25.38
Foreign sales to total sales	57.57	56.32	96.75	0.00	1159.01
Board size	10.87	12.00	5.22	3.00	21.00

## Appendix A2: Regression Results of the 160 Largest German Firms in 2017

	(1)	(2)	(3)	(4)
No. of multi-board men		-0.353** (0.144)	-0.326** (0.143)	-0.335** (0.141)
No. of multi-board women			0.162* (0.086)	0.176** (0.085)
Top 100 (0/1)				0.383** (0.165)
Men's average degree	0.322** (0.154)	0.679*** (0.210)	0.610*** (0.211)	0.614*** (0.208)
Firm size	-0.005 (0.099)	0.000 (0.097)	0.040 (0.098)	-0.010 (0.099)
EBIT	-0.026 (0.094)	0.048 (0.097)	-0.010 (0.101)	-0.034 (0.100)
ROA	0.034 (0.079)	0.008 (0.079)	0.021 (0.078)	0.023 (0.077)
Foreign sales to total sales	0.129* (0.077)	0.133* (0.075)	0.129* (0.075)	0.110 (0.074)
Board size	0.186 (0.152)	0.061 (0.158)	0.039 (0.157)	0.011 (0.155)
Constant	-0.004 (0.075)	0.000 (0.073)	-0.003 (0.073)	-0.240* (0.125)
Observations	146 <sup>a</sup>	146	146	146
R <sup>2</sup>	0.234	0.266	0.285	0.312

Standard errors in parentheses

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$

<sup>a</sup>We have 14 missing observations due to incomplete information about ROA and foreign sales to total sales

## Appendix A3: Dummies for the Number of Multi-board Men (160 Firms in 2017)

	(1)	(2)	(3)	(4)	(5)
Dum0	-0.324* (0.192)				
Dum1		-0.405 (0.291)			
Dum2			-0.405 (0.291)		
Dum3				-0.405 (0.291)	
Dum4					-0.239 (0.315)
Dum5					

	(1)	(2)	(3)	(4)	(5)
No. of multi-board women	0.007 (0.103)	0.021 (0.102)	0.021 (0.102)	0.021 (0.102)	0.020 (0.103)
Men's average degree	0.427** (0.178)	0.456** (0.203)	0.456** (0.203)	0.456** (0.203)	0.322* (0.169)
Constant	0.177 (0.131)	0.110 (0.111)	0.110 (0.111)	0.110 (0.111)	0.030 (0.087)
Observations	146	146	146	146	146
R <sup>2</sup>	0.309	0.305	0.305	0.305	0.298

Dum(x) is the dummy variable for which the boards with fewer than x multi-board men are coded as 0, and others are coded as 1

Standard errors in parentheses

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$

## Appendix A4: The List of DAX30 Companies

No.	Company name
1	Adidas AG
2	Allianz SE
3	BASF SE
4	Bayer AG
5	Bayerische Motoren Werke AG
6	Beiersdorf AG
7	Commerzbank AG
8	Continental AG
9	Daimler AG
10	Deutsche Bank AG
11	Deutsche Boerse AG
12	Deutsche Lufthansa AG
13	Deutsche Post AG
14	Deutsche Telekom AG
15	E.ON SE
16	Fresenius Medical Care AG and Co KGaA
17	Fresenius SE and Co KGaA
18	Heidelbergcement AG
19	Henkel and Co KGaA AG
20	Infineon Technologies AG
21	KandS AG
22	Lanxess AG
23	Linde AG
24	Merck KGaA
25	Muenchener Rueckversicherungs Gesellschaft in Muenchen AG
26	RWE AG
27	SAP SE
28	Siemens AG
29	ThyssenKrupp AG
30	Volkswagen AG



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