

Influence of CEO's gender on financial performance: the role of mentoring

Our study investigates the influence of gender on mentoring a woman CEO by the Board Chair on the company's financial performance, using the ASX 100 companies. We find that women remain poorly represented as Board Chair and CEO levels in most Australian industries. Our study also uncovers, through a two stage least squares regression, that there has only been a marginal increase in women in these positions despite research advocating the positives which women bring in those two roles.

Keywords: Social Role Theory, Mentoring, Gender, Board Chair, CEO, Financial Performance, Australia.

Introduction

Why men and women behave differently in many situations but similarly in others remains a fundamental query about human life? Since the last decades, there has been growing and renewed attention on diversity at the apex of Corporations, namely, in CEO and Board Chair positions (Dwivedi, Misangyi, and Joshi, 2021; Dwivedi, Joshi, and Misangyi, 2018; Muller-Kahle and Schiehl, 2013; Palvia, Vähämaa, and Vähämaa, 2015). Among various diversity demographic factors, gender took precedence, with many countries legislating board seats for woman in senior corporate roles, including the board room (Cummings and Leung, 2021; Terjesen, Aguilera and Lorenz, 2015). There has been a growing research interest in the presence of women in board positions and their influence on firm performance (Adams & Ferreira, 2009; Khan & Vieito, 2013; Post & Byron, 2015; Ullah, Fang & Jebran, 2019) which was, in turn, exhibited by an improvement of board diversity figures within organisations worldwide, however the number of woman CEO and Board Chair continue to be low.

Importantly, a recent study by Deloitte (2022) indicates women remain almost excluded as Board Chairs and CEOs and shows that the growth of women on boards has stagnated at 20% globally. In February 2022, the FTSE (UK Stock Exchange) announced four new recommendations for including more women in senior corporate roles. One rule is pertinent to our study, that of having at least a woman Board Chair, Senior Independent Director and a woman CEO and CFO by 2025 across FTSE 350 (WomenLeaders, 2022). Our research looks into this issue in the Australian context, an Anglo-Saxon nation. Australia is one of the few countries to have gone above 30% of women on boards of its top listed companies without decreeing quotas until 2019 (ASX, 2019). Organisations such as the Australian Institute of Company Directors (AICD) played a vital role which contributed to this figure, through their flagship mentoring programme. Mentoring women to gain board seats have been undertaken by the AICD since 2010 with very positive results. While the in women on boards have certainly increased, Australia follows the worldwide trend of having visibly few women as CEOs and Board Chairs (AICD, 2022). “This lack of growth is stark (in woman Board Chairs) – in contrast to the impressive increase in gender balance at director level” (AICD, 2022).

To date most research has focused on the monitoring role of Boards (Baldenius, Melumad, and Meng, 2011; Jiang and Liu, 2021), and some studies have evaluated their advisory responsibilities (Baldenius, Melumad, and Meng, 2011; Zalata, Ntim, Choudhry, Hassanein, and Elzahr, 2019). Little is known about the influence of the mentoring role of the Board

Chair on the CEO (Kram, 1985; Clutterbuck & Megginson, 1999; Gabrielson *et al.*, 2007; Mullen and Klimatis, 2021). The present investigation examines the influence of gender on the mentoring relationship using the social role theory (Eagly, 1987); and the mentoring concept (Kram, 1983, Mullen and Klimatis, 2021). Mentoring "is relational and developmental," it has essential career and relational responsibilities, and "includes phases and transitions" (Kram, 1983, p.611).

The purpose of this paper is to examine, through the lens of social role theory and mentoring, the causes of the gender imbalance at the CEO and Board Chair levels. Our findings are analysed using a two-stage least-squares method. We discovered that despite research undertaken two decades ago demonstrating that women perform better than men in CEO and Board Chair positions (Peni, 2004), there has been only a marginal increase in the number of women holding these two positions; therefore, the gender gap persists at this level.

Relying on the insights of social role and gender socialisation theories we attempt to explain the dynamics underlying the diverse mentoring relationship between woman CEO and her board chair; and ultimately on the company financial performance. This paper proceeds by: i) reviewing the literature on the social role theory and mentoring relationship; ii) describing the data collection procedure and analysis and iii) progresses with a discussion of our findings and by delineating our study's contributions and limitations and potential research possibilities.

Literature review

Social Role Theory

This study relies on the insights from social role and gender socialisation theories to explain the underlying dynamics of the mentoring process between woman CEOs and Board Chairs on corporate financial performance. Social role theory (Eagly, 1987) offers a plausible explanation for the origins of gender differences in social behaviour. According to proponents of this theory, gender differences in social behaviour are predominantly the result of ingrained, socially sanctioned gender role expectations in daily social interactions. Social role theory is founded on extensive scholarly research originating from gender stereotypes that examined how commonly held social stereotypes influence the behaviour of women and men. According to this theory, women are frequently expected to exhibit a 'communal' approach that emphasises concern for others, sociability, and selflessness. In contrast, males are expected to demonstrate "aggressive" traits such as independence, assertiveness, and competence. Since the beginning

of the second-wave of the feminist movement, gender equality has been a major societal objective for many individuals. Despite the fact that a great deal of social policy has been devised to promote equality, there are still ongoing debates about whether equality will be achieved. The reception of affirmative action programmes that facilitate women's entry into non-traditional roles has been uneven (Heilman and Hayes, 2005). Franke et al. (1997) used the central tenets of social role theory to examine gender differences in the domain of leadership. In order to gain the support of their followers and other stakeholders, female leaders must act in accordance with the socially sanctioned role expectations they confront (Eagly & Johnson, 1990). Previous research has indicated that society expects female leaders to exhibit greater 'ethical concern' and compassion than their male counterparts (Gilligan, 1982; Kennedy & Kray, 2014). According to earlier studies, senior female corporate leaders, including female CEOs and Board Chairs, were more likely than their male counterparts to support and promote other female and minority employees in executive and supervisory positions (Matsa & Miller, 2011; Cohen & Broschak, 2013). The effects of female CEOs' emphasis on supporting the career advancement of other women and minorities within the organisation are significant. As more women attain executive positions, they are less likely to tolerate discrimination. Women entering male-dominated roles face cultural incongruence between beliefs about what it takes to excel in those roles and stereotypes about women's attributes (e.g. Eagly and Karau, 2002). Therefore, even highly qualified women may be judged to lack the necessary characteristics for success. However, these convictions are not inevitable. As women assume non-traditional roles, individuals may develop new beliefs about women's attributes, given that these beliefs are influenced in part by role performance.

According to social role theory, there is greater power and status associated with men's roles in most societies as well as the distinct activities connected with men's and women's roles which generate sex disparities in people's behaviours through psychological and social processes. This is because the activities associated with men's roles are different from those associated with women's roles, a popular instance, is the commonly used term 'Chairman' to denote the leader of boards of directors. One collection of processes incorporates gender role beliefs, in which individuals of each sex are considered to have features that prepare them for sex-typical labour duties as well as for the relative social status and power of those roles. This set of processes is known as a gender role belief system. The behaviours that are encouraged by the normative expectations connected with gender roles are those that are congruent with the requirements of sex-typical pursuits (Alexander and Wood, 2000). In 1999, Lundberg and

Frankenhaeuser studied the psychological and physiological stress responses related to work and family were studied high-ranking professionals. The primary finding was that both men and women perceived their employment to be challenging and stimulating, although almost all the data indicated that men were in more advantageous circumstances than women. In addition, women were more stressed due to their greater unpaid workload and increased family and domestic responsibilities.

Social role theory provides a framework for comprehending both stability and change in gender roles and the associated behavioural disparities between the sexes. Women's roles shifted as they progressed into new educational and occupational fields as a result of the social changes. The career goals of female college pupils have changed accordingly (Pryor et al., 2006). In addition, meta-analyses indicate that men's tendency to indulge in riskier behaviour than women has decreased over time (Byrnes et al., 1999) and that women are more likely to emerge as leaders in small groups (Eagly and Karau, 2002). In addition, women's self-reported agency has increased over time to become more comparable to men's agency, whereas the sex gap in communion has remained relatively stable (Twenge, 1997, 2001; see Lueptow et al., 2001). This increasing gender similarity in traditionally masculine domains is consistent with women's increasing labour force participation and diminishing emphasis on caregiving and other domestic tasks. It is believed that women and men's personality, cognitive, and physical characteristics have converged over the past 50 years and will continue to converge over the next 50 years, according to Diekmann and Eagly (2000). This perceived convergence consisted primarily of women acquiring characteristics typically associated with males. These studies also demonstrated that perceivers behave like implicit role theorists by presuming that the convergence of women's and men's attributes is a result of their roles becoming increasingly similar.

Despite evidence of social change, it does not appear that males in industrialised nations are experiencing comparable changes in their daily activities as women. Men have only modestly increased their contributions to childcare and housework (Bianchi et al., 2006), and they have yet to enter caring professions and other traditionally female categories of paid employment in large numbers (Queneau, 2006). Given the logic of social role theory, men's characteristics will change to include more communal qualities to the extent that they assume female-typical roles by conducting more family caregiving activities and holding more communally demanding jobs.

Hence, having a woman CEO or Board Chair is uncommon. Women's acceptance into management and other professions has not been accompanied by their entry into upper-level leadership positions, which are viewed as necessitating especially high levels of agentic qualities (Eagly & Carli, 2007). This is due to upper-level leadership roles are viewed as requiring especially high agentic trait levels. She will be a stark contrast to the rest of her male-dominated board, most of them would have been brought in to gratify stakeholders, reinforce legitimacy or simply to abide by governing rules (Burgess & Tharenou, 2002; Wang & Kelan, 2013). Appointing a female Board Chair is analogous to prompting a novel value system that gender classifications are not applicable for board directorship. The representation of a female Board Chair and/or CEO signifies confidence in regarding women's appropriateness for board directorship roles, thus protecting against further gender type bias (Lucas, 2003; Dalton & Dalton, 2010). Thus, if there is no distinction, female and male directors ought to enjoy the same prospects (Wagner, Ford & Ford, 1986). Moreover, Fritz and van Knippenberg (2017) and Vial et al (2016) underline the prominence of the leader's gender, contending that 'leader or organizational features that bring out status attributions and/or lessen subordinates' assessment of power variances could enhance the authenticity for women in leadership positions. By not upholding to the stereotype that male directors are more suitable for board directorship, a female board chair or CEO will signal that female directors are also fit for board roles. A woman board chair will contribute to disengage from the view that man directors are better than their woman counterparts in taking up corporate leadership role (Eagly et al 1995; Eagly, 2007).

In general, societal ideologies and status beliefs that legitimise social inequalities based on sex and other attributes retard progress towards gender equality (Ridgeway, 2006; Sidanius and Pratto, 1999). Women's attitudes and ideologies are more progressive than men's (e.g., Eagly et al., 2003a), and their political commitments and actions continue to accelerate social change (Dodson, 2006; Seguino, 2007). This comprehension could facilitate social policy that allows men and women to occupy a wider variety of social positions. To date, men continue to hold the majority of leadership positions, particularly at upper levels (e.g., Helfat et al., 2006). Even when both spouses are employed full-time, women continue to perform the majority of caregiving and housework (e.g., Bianchi et al., 2006) (US Bureau of Labour Statistics, 2008).

Mentoring

Using the social role theory, we will now critique the mentoring concept. There is widespread agreement that mentoring "is relational and developmental," has both career (instrumental) and psychosocial (relational) roles, and "includes phases and transitions," Kram (1983, p.611). Through mentoring, one has the opportunity to acquire knowledge and expertise from someone who has already done it (Dansky, 1996; Russell & Adams, 1997). Although mentoring is now acknowledged to have a variety of personal and organisational benefits (Glass & Walter, 2000; Level & Mach, 2005; Wasburn, Wasburn-Moses, & Blackman, 2008), most research on mentoring focuses on dyadic relationships (Dansky, 1996). A personal-professional connection to an organisational, cultural, and global setting, as well as a systemic reform plan that increases human capacity, are examples of contexts for mentoring (Mullen and Klimatis, 2021). Effective mentoring is described as deep, egalitarian learning with socially transformational value. There are diverse viewpoints on mentorship that are relevant to society and education. The scope and limitations of mentoring are an uncertain if not contentious topic involving judgement (Mullen and Klimatis, 2021).

The seminal studies by Kram (1985) and (Mullen and Klimatis, 2021) have demonstrated that the concept of *mentor* could be fluid, that it has different meanings to different people. For example, Haggard and her colleagues undertook a review and found 40 different definitions of mentor. Mullen and Klimatis undertook a similar study ranging from 1995 to 2019, and uncovered 90 studies, which they analysed closely and found mentoring literature yields nine mentoring alternatives, namely, formal, informal, diverse, electronic, collaborative, group, peer, multilevel, and cultural. Together, they convey aspects of what makes mentoring progressive without identifying every form of mentoring that might have traction in contemporary research (Mullen and Klimatis, 2021). Only 'diverse' mentoring is applicable to our investigation (Clutterbuck and Megginson, 1999; Mullen and Klimatis, 2021) as the Board Chair assists the woman CEO transition in her new role by sharing substantial experience, job and or thoughts when and if required.

Diverse mentoring and what mentoring is not.

Cross-gender mentoring are relationships between mentors and mentees from different demographic groups (Johnson, 2017; Windchief and Brown, 2017, Cobb-Roberts, Esnard, Unterreiner, *et al.* 2017). In line, with the concept of social justice, underrepresented groups,

such as woman faculty and students have the right to be mentored within institutions as opposed to being disregarded or neglected (Cobb-Roberts, Esnard, Unterreiner, *et al.* 2017). Women and men mentors should not be limited to mentoring their own gender (Johnson, 2017).

It is possible for us to fail to convey what mentoring is not, while scholars discuss what mentoring is, and what constitutes a good mentoring relationship. Mentoring is not the same thing as coaching, induction, training, a one-way street, therapy, a cure-all, a bandage that metaphorically binds a wound, or a one-time intervention to heal a problem, according to one line of argument (Mullen and Klimatis, 2021). Mentors are usually colleagues in the same institution, while executive coaches are from the outside (Feldman, 2001; Hall et al, 1999).

Mentoring Woman Leaders

There is already ambiguity concerning the influence of mentoring on senior leaders (Hobson & Sharp, 2005) which is compounded in the case of diverse mentoring, that is, the Board Chair and CEO not being of the same gender. Rosser (2005) concluded that not every (woman) CEO had constructive experiences with their Board Chair, with some even describing the relationship as discouraging. Still, CEOs in general have acquired expertise and developed from their relationships with their Board Chairs (Rosser, 2005). In contrast, Ragins, Cotton and Miller (2000) affirmed that it is better for the CEO not to have a mentor rather than being in an adverse mentoring relationship with the mentor, Board Chair. Highly effective mentoring relationships are naturally intense during the early stages of one's career (Cotton & Miller, 2000). In the case of first time CEOs, they need considerable social support, career advancement advice, and importantly a moral role model (Donaldson, Ensher & Grant-Vallone, 2000), when they are newly promoted. Rosser (2005) also found that CEO relationships with their mentors could carry on for longer than forty years, that is, their entire working life. This contrasts with the perspective of Kram (1985) that the relationship comes to a natural end. Still, in line with Kram (1985), Rosser (2005) and Mullen and Klimatis (2021) concur that the relationship changes over the stretch of time.

Mentoring leaders is filled with trials, the unyielding need to reassess and redress, for instance, when complicated issues that are contingent with the job surface (Clutterbuck, 2004; Stewart, 1991). In 1999, Baugh and Scandura, investigated executives who had mentors and those who did not and concluded that, having mentors led to superior level of job satisfaction, greater career outlook, improved responsibility to the workplace, and a significant reduction in

uncertainty vis-à-vis the work responsibilities. On the other hand, they also found an increased probability of tension as the number of mentors grows due to behavioural clashes, (Baugh & Scandura, 1999), resulting in a reduction in the quality of mentoring received by the CEOs. Studies on this dyadic relationship draw, as a whole, on the duties of the Board Chair and CEO on the ways by which their tasks are steered to endure the intrinsic strains, such as personality clashes that accompany the positions; and to a slighter degree, on how the relationship operates in answer to those intrinsic strains in the corporate environment which can include scantiness of resources (Smith and Lewis, 2011).

Mentoring: enabling the match

The study of Kaemmerer-Muller and Judge (2008) demonstrated the definite advantages of mentoring in the development of CEOs and its pervasiveness in practice. For this study, we consider solely the role of the Board Chair as he or she mentors the woman CEO, to achieve the company's financial goals, that is, the financial well-being during one financial year. The worthiness of mentoring CEOs was established by the study of Moore and Wang (2017). The latter also concluded that mentoring results in positives, as the significance of a psychologically secure atmosphere to encourage not only for leaders, but for other members of the organisation to provide candid advice. Moreover, their results urge companies to pre-emptively and carefully focus on mentoring top leadership, while allowing for differences in the leader's cognitive adaptability. Essentially, it is critical to concede the loneliness experienced by the new CEO as she climbs up from upper middle management and is in need for new role socialisation (Stead, 2005). This loneliness is amplified when the new CEO is female, as such mentoring assistance from the Board Chair, becomes essential. At this level of the corporate, it would be presumed that the concerns of the company performance will prevail over gender issues.

The relationship between the Board Chair and the CEO has been widely studied with some referring to the relationship as 'sacred and secret' (Kakabadse, Kakabadse & Barratt, 2005; Cadbury, 1992), the 'chemistry factor' (Kakabadse, Kakabadse & Knyght, 2010) and early studies referred to it as a 'cabal' (Zohar, 1931). Though scant, the connection has also been studied in the non-profit sector (Conforth & Macmillan, 2016; Feng, Hao and Feely, 2021). Still, the main responsibility of any Board Chair remains that he or she has to provide assistance to the CEO when required (OECD, 2015). A practitioner study undertaken with 12 CEOs of FTSE 100 companies by Spencer Stuart (2003), twenty years later, the FTSE Women Leaders

review report that only 25% woman hold the CEO positions (WomenLeaders, 2022) and showed that a healthy connection is vital for the adequate running of the Board, and by extension the financial health of the company. The significance of the rapport is vital or even the ‘focal point’ around which leadership is drawn (Pye, 2005). The examination of role composition and mutual influence originates from a study by Hodgson et al (1965), who dubbed the process an “emotional division of labour”, a differentiation of task by each role holder, in such a way that they turn out to operate in harmony and well-adjusted pair (Hodgson et al 1965, pg 21). In the Israeli setting, Chitayat (1984) investigated the working rapport between Board Chairs and CEOs, and found the relationship largely depends on the firm’s configuration and the incumbents’ temperament, and the responsibility of the Board Chair as a mentor to the CEO.

Table A: Major differences and similarities in CEO and Board Chair roles.

(Source: Adapted from Gabrielson et al., 2007)

As can be noted from Table A, the roles are quite distinct yet with subtle overlapping, for instance the paradox between the mentoring and monitoring roles. Though, these are conflicting roles, a proficient Board Chair would undertake both successfully, with the end results benefitting company. The Board Chair would be a natural mentor for the CEO, given that she or he has more experience than the CEO (Greene, 2014). However, if the two are not able to work effectively together due to, personality clashes, then it would be the responsibility of the Board to ensure that this situation does not harm company performance, by sustaining the delivery of positive financial results thus aligning with the notion of "positive mentoring," for instance. Positive mentoring refers to the "quality of the relationship" and whether mentees find it affirming (p. 31). Mentoring theorists concur that interaction quality in mentor–mentee relationship is the most important factor in mentoring effectiveness. In positive mentoring situations, assumptions are addressed and negativity is monitored using metacognitive strategies, such as dialogic probes for understanding challenging issues and instruments for assessing mentoring efficacy (e.g. mentee support).

Country Context

We chose Australia, as it figures among the rare countries in the world to have reached 30 per cent women on Boards without instituting gender quotas (Chapple and Humphrey, 2014; EgonZehnder, 2022) which is an indication of Australian companies' progressive views towards women. Australia follows the Anglo-Saxon model of corporate governance. Mandating board gender balance is a social policy mechanism, which by implicit agreement is unconnected to matters such as financial performance of the company. Even so, enforcing this policy will bear unintentional outcomes (positive or negative) for company value, which is of significance to all who have a vested interest in the company and not just its owners (Eckbo, Nygaard and Thorburn, 2022).

According to the AICD (2022) most women surveyed have expressed their satisfaction with the quality of mentoring they have received (AICD, 2022). To date 389 women have benefitted from this AICD flagship programme (AICD, 2022) and secured board positions. This regression stands as an important reminder about the fragility of progress, and the importance of transparent and regular reporting to ensure continued accountability (AICD, 2022).

Our study utilises Australian Stock Exchange (ASX 100) companies to test our hypotheses. This study is guided by the ASX listing rules specifically Sections 14.4 and 14.5:

- Section 14.4 stipulates “this rule applies from the time of an entity’s admission to the official list. A director appointed prior to the entity’s admission to the official list must not hold office (without re-election) past the third annual general meeting following the entity’s admission to the official list, whichever is longer, and
- Section 14.5: An entity which has directors must hold election of directors at *each annual general meeting*. Note: *This rule applies even where no director is required to stand for re-election at each annual general meeting under rule 14.4*. An entity must have at least one director for election at each annual general meeting. If it does not have a new director stand for election, and no director is due to stand for re-election under rule 14.4, *the entity must select at least one of its existing directors to stand for re-election*” (ASX, 2022). Typically, an entity will undertake the selection by calling for a volunteer or by drawing lots.

Based on the above, we decided to limit the duration of mentoring process of CEO to be one year. Given that all directors including the Board Chair could be selected for re-election on, at

least an annual basis. Thus, ASX CG rules and regulations do not allow us to undertake a more in-depth development of mentoring relationships. As such we capture data strictly based on the ASX CG rules and regulations.

In order to test our theory, we formulate the following hypotheses. First, we hypothesize that a woman CEO who has been positively mentored by the woman or man Board Chair will be a more efficient CEO. Secondly, based on the first hypothesis, we hypothesize that positive mentoring will result in positive financial performance.

Variables Description

Firm Performance

Considering that ‘mentoring’ of CEOs is not an observable behaviour, their performance will be tied to observables such poor or good firm performance (Farrell and Whidbee, 2003). As such, we follow previous studies measuring ‘financial performance’ by adopting Q and RoA to calculate financial performance of the firm. Q is calculated as the sum of value of stock and the book value of debt divided by the book value of total assets. There are few studies that utilised solely Q, these are: Adams and Ferreira, 2009; Campbell and Minguez-Vera, (2010); Reguera-Alvarado, de Fuentes, and Laffarga, 2017. These authors favoured Q over accounting measures as it provides a reflection of market expectations of future earnings which, as result, is a good rule to gauge a firm’s financial well-being (Campbell and Minguez-Vera, 2008). The unity of the Q ratio, offers a distinct index for the calculation of firm performance. If Q ratio is greater than 1.0, then investors can presume to be able to generate more value by utilising existing resources wisely, on the other hand if the Q ratio is less than 1.0, then investors can presume mismanagement of existing resources, moreover, Q accounts for risk (Coles et al, 2008) and is unlikely to convey biased figures due to tax legislations across industries and other accounting standards.

Our study follows the majority of studies and include Q along with RoA (Adams and Feirrera, 2009; García-Meca, García-Sánchez, and Martínez-Ferrero, 2015; Bennouri, et al., 2018). RoA is calculated as the ratio of a firm’s annual net income to the average total assets during a financial year. In 1996, Barber and Lyon undertook a rigorous analysis of accounting-based measures and demonstrated several advantages for undertaking an RoA, to gauge operating

performance. They also highlighted the superiority of RoA compared to Net Income, RoA adjusts to firm size, allowing for simple comparison among firms.

Board Gender Diversity

fBC_{it}, mBC_{it} and fCEO_{it} are woman and man Board Chair and CEO of firm *i* at time *t*, respectively, and as proxy for gender diversity, we utilise two variables: i) Blau's and ii) Shanonn's Indices. Gender Diversity was captured by Blau's (1977) $H = 1 - \sum_{i=1}^i P_i(\ln P_i)$ and Shanonn's (1980) $H = - \sum_{i=1}^i P_i(\ln P_i)$ instruments respectively with P_i representing the proportion of male and female on the Board of Directors.

Instrumental variables

Additionally, we include two control variables which could be related to the presence of women as Board Chair and CEO. Firstly, we adhere to the study of Nair & Kotha (2001) to control for industry membership and secondly to Carter et al (2003) for company size and board size.

We were required to look for instruments related to the Board Chair and woman CEO, and unrelated to firm performance. This step is challenging in that most observable variables were already incorporated in our equation, thus rendering them hard to be identified (Campa and Kedia, 2002). According to Baum (2006), for an instrument to be binding, it must meet at least two criteria: firstly, it must be unrelated with the error term in the principal performance equation, apart from the control variables already in the regression, that is meet the orthogonality criteria, and secondly be connected to the endogenous variable, thus weak instruments. As such, instrumental variables, are expected to rationally deduce the endogenous variable, the woman CEO, while remaining uncorrelated with the measure of firm performance in our model, that is Q.

Data and Methodology

Data collection and Sample

The sample frame was made up of the top 100 companies listed on the Australian Stock Exchange (hereafter, ASX100) (it is important to note that some companies also trade on other Stock Exchanges). The selected companies were ranked by market capitalisation by the ASX. We utilised secondary data by sourcing 11-year archival data: 2010 to 2020 from two databases, namely, BoardEx for corporate governance related variables (CEO's and Board

Chair's Gender, Tenure, Board Size, Industry Membership) and CompuStat for finance related variables (Return on Assets (RoA), Revenue, Tobin's Q (Q) and Firm size). It is important to note that both BoardEx and CompuStat are the most widely used databases, they have been used in similar research (Gao, Lin and Sun, 2022). Ethnicity data was hand collected and recorded as per the Australian Standard Classification of Cultural and Ethnic groups (ASCCEG). According to Scandura and Pellegrini (2007), data that are simply gathered from the mentor or mentee may be biased. Consequently, gathering data from third parties such as databases compiled by industry experts could result in a perception of the connection that is more impartial.

In a few cases, companies' annual reports were manually searched to make up for missing data. We were able to collect data for all 100 companies, thereby encompassing 1,428 firm-years observations. Table B provides an overview of the makeup of the eleven Australian industry sectors from 2010 to 2020; and Tables C and D make available the percentage female Board Chairs and CEOs respectively, and it is evident that the women Board Chair (29.65%) and women CEOs (29.00%) in the 'financial' sector are the most prominent sectors with women at the apex of the Australian economy.

Insert Table B about here

Insert Table C about here

Insert Table D about here

Table E provides the board size the total number of directors, the number of female Board Chairs 91 (0.7%) and female CEOs 75 (0.6%), both being very low compared to their male counterparts. Thus, confirming that female representation at the highest echelon of the companies is still not equitable, despite evidence that female Board Chairs and CEOs outperform their male counterparts (Peni, 2004). Hence, affirming that Australian companies follow the world trend of having extremely few female Board Chairs and CEOs.

Insert Table E about here

Results and Discussion

Descriptive Statistics and Correlations

Table F contains descriptive statistics regarding the main sample. The average number of board members is 8.1, with a minimum of 3 and a maximum of 15 members. The mean Board Chair

and CEO ages are 64 and 53 years, while Board Chair and CEO tenures are 4.6 and 4.5 years correspondingly. Meanwhile, the gender diversity of the board was determined by the averages of Blau's and Shannon's Indices, which were 0.29 and 0.44, respectively. Both measures of firm performance Tobin's Q range in the region of 3.5 and ROA of 7.75. The sample companies' average size (LOGAssets) is 6.85, with a standard deviation of 0.50. These findings concur with those Mahdi et al. (2012). Table G presents the Pearson correlation matrix of our variables. The most significant correlations appear between the variables: woman CEO and i) the tenure of the Board Chair, ii) the ethnicity of the Board Chair, iii) the BoardSize are less than 0.01%. The remaining variables are either not correlated, or the relations are not very significant due to their coefficients being low.

Insert Table F about here

Insert Table G about here

Estimation of instrumental variables

In accordance with our theoretical arguments, there is a strong likelihood for endogeneity and causality between woman CEO and firm performance (Campbell and Minguez-Vera, 2008; Srinidhi et al., 2011; Facio et al., 2016). To confirm its empirical presence, we conducted an endogeneity test (Baum et al., 2007). Given our resulting p-values are significant, our results confirmed (Table H), hence we accept the null hypothesis and confirm the presence of endogeneity between woman CEO and woman/man Board Chair. We assume that a set of variables that affect that the performance of the woman CEO contributes to financial performance but is not directly linked to Q, which is the influence of the mentoring by her Board Chair that she has received. The course of implementing the two-stage instrumental variables (IV) regression. Based on the results of Eq. 1, we know that the number of women (f) and men (m) on the board of directors of company i at time t is:

$$Q_{it} = \beta_0 + \beta_1 \times fCEO_{it} + \beta_2 \times mBC_{it} + \beta_3 \times fBC_{it} + \beta_4 \times BoardSize_{it} + \beta_5 \times LOGASSET_{it} + INDUS_{it} + e_{it}$$

Where Q is the financial performance, GEO_Gender is the woman CEO and her performance is determined by the quality of mentorship she receives by her Board Chair (mBC is man Board Chair and fBC is woman Board Chair), additionally we control for Industry membership

(Indus), company size (LOGAssets) and board size (BoardSize). Industry are dummy variables for each sector, and e is the error term.

Next, in order to analyse the effect of the mentoring relationship between the woman CEO and her Board Chair, we undertook a panel data methodology. This methodology allows us to control for unobservable constant heterogeneity or fixed effects (Arellano, 2003). This term is intended to reflect the firm-level characteristics, and it helps circumvents any omission bias and provides efficient estimates. The fixed effects term (that is, mentoring) is unobservable and as a result incorporated in the random disturbance. The relationship between the fixed effects term and the other explanatory variables is a crucial component of panel data. This correlation was examined using the Durbin and Wu- Hausman tests (Table H), which examines the null hypothesis of no correlation between the independent variables and the fixed effects term. Durbin and Wu- Hausman tests to choose the most suitable estimation method.

Table I displays the outcomes of the first instrumental variables (IV) estimation (OLS regression). These results enable the prognosis of female CEO performance and firm performance. Only 4.9 % (fGen_BC) and 4.9% (mGen_BC) of the variance in the variable Q is accounted for by the resulting models ($R^2 = 0.0490f$ and $R^2 = 0.0491m$, respectively). As for the instrumental variables, BoardSize and LOGAssets, only LOGAssets is significant, and its estimate sign meets our requirements. Table J provides the results of the second-stage instrumental variables (IV) estimation. In this stage, the influence of the woman CEO on the financial performance is examined through the effect of mentoring by the Board Chair. Mentoring has been instrumented by the woman Board Chair and man Board Chair. As can be seen in Table J, our result aligns with the global report that there are fewer woman Board Chair as reflected by the negative results of woman Board Chair mentoring woman CEO. On the other hand, we find an almost double positive results with man Board Chair mentoring woman CEOs which while this contradicts the studies of Johnson, 2017; Windchief and Brown, 2017, Cobb-Roberts, Esnard, Unterreiner, *et al.* 2017) support the fact man Board Chair domination still persist. Alternatively, our results could have been influenced by the ‘Queen Bee syndrome’ (Travis, Staines and Jayaratne, 1973). Travis coined the term "Queen Bee syndrome" to characterise the phenomenon according to which senior women are eager to support the structural hierarchy that allowed them to achieve success. The Queen Bee phenomenon has been described in response to a threat to social identity, which is the formation of an individual's personality based on the groups to which he or she belongs.

Conclusion

From the results it is clear that the ASX ‘financial’, ‘consumer discretionary’ and ‘energy’ sectors have more women in Board Chair and CEO positions aligning with the studies of Kinatader et al (2021), Holst and Kirsch (2016) and Mazotta, Bronzetti and Baldini (2017) that these industries are feminine by nature, 2017. The ‘energy’ sector is the exception though considered a ‘masculine’ sector has attracted a large number of female Board Chairs and CEOs. This could be attributed to the fact that this sector a large percentage of the makeup of Australian listed companies and attracts a large number of female graduates with STEM qualifications (Chandrakumara, McCarthy and Glynn, 2018).

Given that some industries are more feminine than others such as the ‘financial’ and the ‘health’ sectors (Lee, 2014), and others are considered more masculine such as ‘industrials’ or ‘technology’ sectors (Cooper, 2000), we suggest that Corporate within the industries identified as feminine should be the ones to actively promote mentoring their woman board members to Board Chair and CEO positions.

The tenure of the Board Chair and CEO respectively indicating a clear age gap of nearly a decade between Board Chair and CEO, hence supporting the study of Wang and Keelan (2013) whereby the Board Chair could be an apt mentor for the CEO, as they have been in the job for longer than the latter.

Limitations

Our study is not without limitations. Ethnicity diversity within the ASX 100 indicates a serious concern which we have not explored. Both non-white Board Chair and CEO are almost non-existent and could be an area of potential research (Guest, 2019).

References

Adams, R.B. and Ferreira, D., 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), pp.291-309.

Abebe, M.A., Li, P., Acharya, K. and Dasgupta, J.J., 2020. The founder chief executive officer: A review of current insights and directions for future research. *Corporate Governance: An International Review*, 28(6), pp.406-436.

Alexander, M.G. and Wood, W., 2000. Women, men, and positive emotions: A social role interpretation. *Gender and emotion: Social psychological perspectives*, pp.189-210.

Allen, T.D. & L.T. Eby. 2007. *The Blackwell Handbook of Mentoring: A Multiple Perspectives Approach*. Malden, MA: Blackwell Publishing.

Ali, M., Kulik, C.T. and Metz, I., 2011. The gender diversity–performance relationship in services and manufacturing organizations. *The International Journal of Human Resource Management*, 22(07), pp.1464-1485.

Almog, T. & R. Hertz-Lazarowitz. 1999. Teachers as peer learners: professional development in an advanced computer learning environment. In *Cognitive Perspectives on Peer Learning*. A.M. O'Donnell & A. King, Eds.: 285–311. Mahwah, NJ: Lawrence Erlbaum.

Australian Bureau of Statistics (2013) Australian and New Zealand Standard Industrial Classification. Available at: <https://www.abs.gov.au> [Accessed 14 July 2022].

Australian Institute of Company Directors, Newsletter, 2020

Australian Institute of Company Directors, Newsletter, 2021

Australian Institute of Company Directors, Newsletter, 2022

Baldenius, T., Melumad, N.D. and Meng, X., 2011, Advising and Monitoring CEOs: The Dual Role of Boards. AAA.

Bainbridge, S. M. (1993). Independent directors and the ALI corporate governance project. *George Washington Law Review*, 61, 1034–1083

Banerjee, A., Nordqvist, M. and Hellerstedt, K., 2020. The role of the board chair—A literature review and suggestions for future research. *Corporate Governance: An International Review*, 28(6), pp.372-405.

Bem, S.L., 1981. Gender schema theory: A cognitive account of sex typing. *Psychological Review*, 88(4), p.354.

Bem, S.L., 1993. IV. Is there a Place in Psychology for a Feminist Analysis of the Social Context? *Feminism & Psychology*, 3(2), pp.230-234.

Bennouri, M., Chtioui, T., Nagati, H. and Nekhili, M., 2018. Female board directorship and firm performance: What really matters? *Journal of Banking & Finance*, 88, pp.267-291.

Biggs, E.L., 2004. CEO succession planning: An emerging challenge for boards of directors. *Academy of Management Perspectives*, 18(1), pp.105-107.

Blau, P. M. (1977). Inequality and heterogeneity. New York: Free Press

Bona, M.J., J. Rinehart & R.M. Volbrecht. 1995. Show me how to do like you: co-mentoring as feminist pedagogy. *Feminist Teacher* 9: 116–124.

Brammer, S., Millington, A. and Rayton, B., 2007. The contribution of corporate social responsibility to organizational commitment. *The International Journal of Human Resource Management*, 18(10), pp.1701-1719.

Brammer, S., Millington, A. and Pavelin, S., 2007. Gender and Ethnic diversity among UK corporate boards. *Corporate Governance: An International Review*, 15(2), pp.393-403.

Cascio, W.F., 2004. Board governance: A social systems perspective. *Academy of Management Perspectives*, 18(1), pp.97-100.

Cadbury, A., 1992. *Report of the committee on the financial aspects of corporate governance* (Vol. 1). Gee and Co, Ltd.

Campbell, K. and Minguez-Vera, A., 2008. Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, 83(3), pp.435-451.

Campbell, K. and Minguez-Vera, A., 2010. Female board appointments and firm valuation: Short and long-term effects. *Journal of Management & Governance*, 14(1), pp.37-59.

Carter, D.A., Simkins, B.J. and Simpson, W.G., 2003. Corporate governance, board diversity, and firm value. *Financial review*, 38(1), pp.33-53.

Chapple, L. and Humphrey, J.E., 2014. Does board gender diversity have a financial impact? Evidence using stock portfolio performance. *Journal of Business Ethics*, 122(4), pp.709-723.

Chandrakumara, A., McCarthy, G. and Glynn, J., 2018. Exploring the board structures and member profiles of top ASX companies in Australia: an industry-level analysis. *Australian Accounting Review*, 28(2), pp.220-234.

Clutterbuck, D. and Megginson, D., 1999. *Mentoring Executives and Directors*. Routledge.

Cobb-Roberts, D., T. Esnard, A. Unterreiner, *et al.* 2017. Race, gender, and mentoring in higher education. In *The Sage Handbook of Mentoring*. D.A. Clutterbuck, F.K. Kochan, L.G. Lunsford, *et al.*, Eds.: 374–388. Thousand Oaks, CA: Sage.

Coles, J.L., Daniel, N.D. and Naveen, L., 2008. Boards: Does one size fit all? *Journal of Financial Economics*, 87(2), pp.329-356.

Corbin, J.M.; Strauss, A.L. Analyzing Data for Concepts. In *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*; Sage Publications, Inc: Thousand Oaks, CA, USA, 2012; pp. 159–194. ISBN 978-1-4129-0643-2

Cornforth, C. and Macmillan, R., 2016. Evolution in board chair–CEO relationships: A negotiated order perspective. *Non-profit and Voluntary Sector Quarterly*, 45(5), pp.949-970.

Cummings, D. and Leung, T.Y., 2021. Board diversity and corporate innovation: Regional demographics and industry context. *Corporate Governance: An International Review*, 29(3), pp.277-296.

Cumming, D., Leung, T.Y. and Rui, O., 2015. Gender diversity and securities fraud. *Academy of Management Journal*, 58(5), pp.1572-1593.

Daily, C.M. and Dalton, D.R., 1997. CEO and board chair roles held jointly or separately: much ado about nothing? *Academy of Management Perspectives*, 11(3), pp.11-20.

Dalton, D.R. and Dalton, C.M., 2010. Women and corporate boards of directors: The promise of increased, and substantive, participation in the post Sarbanes-Oxley era. *Business Horizons*, 53(3), pp.257-268.

Dansky, K.H., 1996. The effect of group mentoring on career outcomes. *Group & Organization Management*, 21(1), pp.5-21.

de Janasz, S. and Peiperl, M., 2015. Managing yourself: CEOs need mentors too. *Harvard Business Review*, 96(4), pp.100-103.

Donaldson, S.I., Ensher, E.A. and Grant-Vallone, E.J., 2000. Longitudinal examination of mentoring relationships on organizational commitment and citizenship Behavior. *Journal of Career Development*, 26(4), pp.233-249.

Dwivedi, P., Joshi, A. and Misangyi, V.F., 2018. Gender-inclusive gatekeeping: How (mostly male) predecessors influence the success of female CEOs. *Academy of Management Journal*, 61(2), pp.379-404.

Dwivedi, P., Misangyi, V.F. and Joshi, A., 2021. "Burnt by the spotlight": How leadership endorsements impact the longevity of female leaders. *Journal of Applied Psychology*, 106(12), pp. 1885-1906.

Dzickowski, J., 2013, July. Mentoring and leadership development. In *The Educational Forum* Vol. 77, No. 3, pp. 351-360). Taylor & Francis Group.

<https://www.egonzehnder.com/global-board-diversity-tracker/customize-the-data?report=Board+seats+held+by+women&subgroup=Global&year=2020>

Eagly, A.H. (1987) *Sex Differences in Social Behavior: A Social-role Interpretation*. Hillsdale, NJ: Lawrence Erlbaum.

Eagly, A.H. and Johnson, B.T., 1990. Gender and leadership style: A meta-analysis. *Psychological bulletin*, 108(2), p.233.

Eagly, A.H. and Karau, S.J., 2002. Role congruity theory of prejudice toward female leaders. *Psychological review*, 109(3), p.573.

Eagly, A.H., 2007. Female leadership advantage and disadvantage: Resolving the contradictions. *Psychology of women quarterly*, 31(1), pp.1-12.

Eagly, A.H., Karau, S.J. and Makhijani, M.G., 1995. Gender and the effectiveness of leaders: a meta-analysis. *Psychological bulletin*, 117(1), p.125.

Eckbo, B.E., Nygaard, K. and Thorburn, K.S., 2022. Does Mandatory Board Gender-Balancing Reduce Firm Value? *Tuck School of Business Working Paper*, (4039292).

Elsayed, K., 2011. Board size and corporate performance: The missing role of board leadership structure. *Journal of Management & Governance*, 15(3), pp.415-446.

Faccio, M., Marchica, M.T. and Mura, R., 2016. CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, 39, pp.193-209.

Farrell, K.A. and Hersch, P.L., 2005. Additions to corporate boards: The effect of gender. *Journal of Corporate Finance*, 11(1-2), pp.85-106.

Farrell, K.A. and Whidbee, D.A., 2003. Impact of firm performance expectations on CEO turnover and replacement decisions. *Journal of Accounting and Economics*, 36(1-3), pp.165-196.

Feng, N.C., Hao, X. and Neely, D., 2021. Board chair-CEO relationship, board chair characteristics, and nonprofit executive compensation. *Journal of Public and Non-profit Affairs*, pp.1-18.

Fritz, C. and van Knippenberg, D., 2017. Gender and leadership aspiration: The impact of organizational identification. *Leadership & Organization Development Journal*, 38(8), pp. 1018-1037

Furlotti, K., Mazza, T., Tibiletti, V. and Triani, S., 2019. Women in top positions on boards of directors: Gender policies disclosed in Italian sustainability reporting. *Corporate Social Responsibility and Environmental Management*, 26(1), pp.57-70.

Gabrielsson, J., Huse, M. and Minichilli, A., 2007. Understanding the leadership role of the board chairperson through a team production approach. *International Journal of Leadership Studies*, 3(1), pp.21-39.

Gao, X., Lin, Z.H. and Sun, L., 2022. CEO-director connectedness and firm's operational risk. *Applied Economics Letters*, 29(12), pp.1102-1106.

Garcia-Castro, R., Arin˜o, M., & Canela, M. 2010. Does social performance really lead to financial performance? Accounting for endogeneity. *Journal of Business Ethics*, 92, 107–126.

García-Meca, E., García-Sánchez, I.M. and Martínez-Ferrero, J., 2015. Board diversity and its effects on bank performance: An international analysis. *Journal of Banking & Finance*, 53, pp.202-214.

Garvey, A.M., Kim, T. and Duhachek, A., 2022. Bad News? Send an AI. Good News? Send a Human. *Journal of Marketing*, p.00222429211066972.

G20/OECD Principles of Corporate Governance, pg 42.

Glass, N. and Walter, R., 2000. An experience of peer mentoring with student nurses: enhancement of personal and professional growth. *Journal of Nursing Education*, 39(4), pp.155-160.

Greene, M.P., 2014. *Creative mentorship and career-building strategies: How to build your virtual personal board of directors*. Oxford University Press.

Guerrero, S., Lapalme, M.È. and Séguin, M., 2015. Board chair authentic leadership and nonexecutives' motivation and commitment. *Journal of Leadership & Organizational Studies*, 22(1), pp.88-101.

Guest, P.M., 2019. Does board ethnic diversity impact board monitoring outcomes? *British Journal of Management*, 30(1), pp.53-74.

Haggard, D.L., Dougherty, T.W., Turban, D.B. and Wilbanks, J.E., 2011. Who is a mentor? A review of evolving definitions and implications for research. *Journal of Management*, 37(1), pp.280-304.

Heilman, M.E., 2012. Gender stereotypes and workplace bias. *Research in organizational Behavior*, 32, pp.113-135.

Hillman, A.J., Shropshire, C. and Cannella Jr, A.A., 2007. Organizational predictors of women on corporate boards. *Academy of Management Journal*, 50(4), pp.941-952.

Holst, E. and Kirsch, A., 2016. Financial sector: share of women on corporate boards increases slightly but men still call the shots. *DIW Economic Bulletin*, 6(3), pp.27-38.

Johnson, W.B. 2017. Ethical considerations for mentors: towards a mentoring code of ethics. In *The Sage Handbook of Mentoring*. D.A. Clutterbuck, F.K. Kochan, L.G. Lunsford, et al., Eds.: 105–118. Thousand Oaks, CA: Sage.

Kakabadse, A.P., Kakabadse, N.K. and Barratt, R., 2006. CSR in the Boardroom: Contribution of the Non-Executive Director (NED). In *Corporate Social Responsibility* (pp. 284-299). Palgrave Macmillan, London.

Kakabadse, A.P., Kakabadse, N.K. and Knyght, R., 2010. The chemistry factor in the Chairman/CEO relationship. *European Management Journal*, 28(4), pp.285-296.

Kammeyer-Mueller, J.D. and Judge, T.A., 2008. A quantitative review of mentoring research: Test of a model. *Journal of Vocational Behaviour*, 72(3), pp.269-283.

Khan, W.A. and Vieito, J.P., 2013. CEO gender and firm performance. *Journal of Economics and Business*, 67, pp.55-66.

Khurana, R. 2002. The curse of the superstar CEO. *Harvard Business Review*, 80(9), 2-8.

Kinateder, H., Choudhury, T., Zaman, R., Scagnelli, S.D. and Sohel, N., 2021. Does boardroom gender diversity decrease credit risk in the financial sector? Worldwide evidence. *Journal of International Financial Markets, Institutions and Money*, 73, p.101347.

Kram, K.E., 1983. Phases of the mentor relationship. *Academy of Management Journal*, 26(4), pp.608-625.

Kram, K. E. (1985). *Mentoring at work: Developmental relationships in organizational life*. Glenview, IL: Scott Foresman.

Knockaert, M., Bjornali, E.S. and Erikson, T., 2015. Joining forces: Top management team and board chair characteristics as antecedents of board service involvement. *Journal of Business Venturing*, 30(3), pp.420-435.

Krause, R., 2017. Being the CEO's boss: An examination of board chair orientations. *Strategic Management Journal*, 38(3), pp.697-713.

Krause, R., Li, W., Ma, X. and Bruton, G.D., 2019. The board chair effect across countries: An institutional view. *Strategic Management Journal*, 40(10), pp.1570-1592.

Krause, R. and Semadeni, M., 2013. Apprentice, departure, and demotion: An examination of the three types of CEO–board chair separation. *Academy of Management Journal*, 56(3), pp.805-826.

Lee, Y.J., 2014. The feminine sector: Explaining the overrepresentation of women in the nonprofit sector in the USA. *International Journal of Social Economics* 41(17), pp.556-572.

Level, A.V. and Mach, M., 2005. Peer mentoring: One institution's approach to mentoring academic librarians. *Library Management*, 26(6/7), pp.301-310.

Linehan, M. and Scullion, H., 2008. The development of female global managers: The role of mentoring and networking. *Journal of Business Ethics*, 83(1), pp.29-40.

Lucas, J.W., 2003. Status processes and the institutionalization of women as leaders. *American Sociological Review*, pp.464-480.

Lundberg, U. and Frankenhaeuser, M., 1999. Stress and workload of men and women in high-ranking positions. *Journal of Occupational Health Psychology*, 4(2).

Lorsch, J.W., 2009. Leadership: The key to effective boards. *Boardroom realities: Building leaders across your board*, pp.25-50.

Luse, A., Mennecke, B. and Townsend, A., 2012. Selecting a research topic: A framework for doctoral students. *International Journal of Doctoral Studies*, 7(1), pp.143-152.

Mace, M.L., 1971. Directors: myth and reality. Division of Research, Graduate School of Business Administration, Harvard University, Boston, Massachusetts.

Mahdi, M., Mahdi, S., Seyed, J., & Masomeh, N. (2012). A Study of relationship between board characteristics and earning management: Iranian scenario. *Universal Journal of Management and Social Sciences*, 2(3), 12–29.

Marcinkus M, W., 2012. Reverse mentoring at work: Fostering cross-generational learning and developing millennial leaders. *Human Resource Management*, 51(4), pp.549-573.

Mazzotta, R., Bronzetti, G. and Baldini, M.A., 2017. Does board diversity affect firm performance? Evidence from the Italian financial sector. *International Journal of Business Governance and Ethics*, 12(1), pp.65-89.

Mintzberg, H., 1973. Strategy-making in three modes. *California Management Review*, 16(2), pp.44-53.

Moore, J.H. and Wang, Z., 2017. Mentoring top leadership promotes organizational innovativeness through psychological safety and is moderated by cognitive adaptability. *Frontiers in Psychology*, 8, p.318.

Morais, F., Kakabadse, A. and Kakabadse, N., 2018. The chairperson and CEO roles interaction and responses to strategic tensions. *Corporate Governance: The international Journal of Business in Society*.

Muller-Kahle, M.I. and Schiehl, E., 2013. Gaining the ultimate power edge: Women in the dual role of CEO and Chair. *The Leadership Quarterly*, 24(5), pp.666-679.

Mullen, C.A. 2017. Critical issues on democracy and mentoring in education: a debate in the literature. In *The Sage Handbook of Mentoring*. D.A. Clutterbuck, F.K. Kochan, L.G. Lunsford, et al., Eds.: 34–51. Thousand Oaks, CA: Sage.

Mullen, C.A. 2020. Practices of cognitive apprenticeship and peer mentorship in a cross-global STEM lab. In *The Wiley International Handbook of Mentoring: Paradigms, Practices, Programs, and Possibilities*. B. Irby, J. Boswell, L. Searby, F. Kochan & R. Garza, Eds.: 243–260. Malden, MA: Wiley- Blackwell.

Mullen, C.A. and Klimaitis, C.C., 2021. Defining mentoring: a literature review of issues, types, and applications. *Annals of the New York Academy of Sciences*, 1483(1), pp.19-35.

Murphy, W.M. 2012. Reverse mentoring at work: fostering cross-generational learning and developing millennial leaders. *Hum. Resour. Manag.* **51**: 549–574.

Noe, R. A. 1988. An investigation of the determinants of successful assigned mentoring relationships. *Personnel Psychology*, 41: 457–479.

Noland, M., Moran, T. and Kotschwar, B.R., 2016. Is gender diversity profitable? Evidence from a global survey. *Peterson Institute for International Economics Working Paper*, (16-3).

OECD (2012): *Closing the Gender Gap: Act Now!* OECD Publishing.

OECD (2017), *Methodology for Assessing the Implementation of G20/OECD Principles of Corporate Governance*, OECD Publishing, Paris , <https://doi.org/10.1787/9789264269965-en>

O'Higgins, E., 2009. The chairman of the board of directors: Role and contribution. In *Global Boards* (pp. 217-235). Palgrave Macmillan, London.

O'Neill, R.M. and Blake-Beard, S.D., 2002. Gender barriers to the female mentor–male protégé relationship. *Journal of Business Ethics*, 37(1), pp.51-63.

Palmer, E.M. and Jones, S.J., 2019. Woman–woman mentoring relationships and their roles in tenure attainment. *Journal of Women and Gender in Higher Education*, 12(1), pp.1-17.

Palvia, A., Vähämaa, E. and Vähämaa, S., 2015. Are female CEOs and chairwomen more conservative and risk averse? Evidence from the banking industry during the financial crisis. *Journal of Business Ethics*, 131, pp.577-594.

Parsons, R.D. and Feigen, M.A., 2014. The boardroom's quiet revolution. *Harvard Business Review*, 92(3), pp.98-104.

Peni, E., 2014. CEO and Chairperson characteristics and firm performance. *Journal of Management & Governance*, 18(1), pp.185-205.

Pham, P.K., Suchard, J.A. and Zein, J., 2011. Corporate governance and alternative performance measures: evidence from Australian firms. *Australian Journal of Management*, 36(3), pp.371-386.

Post, C. and Byron, K., 2015. Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, 58(5), pp.1546-1571.

Post, C., Lokshin, B. and Boone, C., 2022. What changes after women enter top management teams? A gender-based model of strategic renewal. *Academy of Management Journal*, 65(1), pp.273-303.

Quigley, T.J. and Hambrick, D.C., 2012. When the former CEO stays on as board chair: Effects on successor discretion, strategic change, and performance. *Strategic Management Journal*, 33(7), pp.834-859.

Rayburn, C.A., F.L. Denmark, M.E. Reuder & A.M. Austria. 2010. *A Handbook for Women Mentors: Transcending Barriers of Stereotype, Race, and Ethnicity*. Denver, CO: Praeger.

Reguera-Alvarado, N., de Fuentes, P. and Laffarga, J., 2017. Does board gender diversity influence financial performance? Evidence from Spain. *Journal of Business Ethics*, 141(2), pp.337-350.

Roberts, J., 2002. Building the complementary board. The work of the plc chairman. *Long Range Planning*, 35(5), pp.493-520.

Rosser, M.H., 2005. Mentoring from the top: CEO perspectives. *Advances in Developing Human Resources*, 7(4), pp.527-539.

Russell, J.E. and Adams, D.M., 1997. The changing nature of mentoring in organizations: An introduction to the special issue on mentoring in organizations. *Journal of Vocational Behavior*, 51(1), pp.1-14.

Scandura, T.A. and Pellegrini, E.K., 2007. Workplace mentoring: Theoretical approaches and methodological issues. *The Blackwell handbook of mentoring: A multiple perspectives approach*, pp.71-91.

Schepker, D.J., Nyberg, A.J., Ulrich, M.D. and Wright, P.M., 2018. Planning for future leadership: Procedural rationality, formalized succession processes, and CEO influence in CEO succession planning. *Academy of Management Journal*, 61(2), pp.523-552.

Shekshnia, S., 2018. How to be a good board chair. *Harvard Business Review*, 96(2), pp.96-105.

Schunk, D.H. and Mullen, C.A., 2013. Toward a conceptual model of mentoring research: Integration with self-regulated learning. *Educational Psychology Review*, 25, pp.361-389.

Silver, I. and Shaw, A., 2022. When and why “staying out of it” backfires in moral and political disagreements. *Journal of Experimental Psychology: General*.

Srivastava, C., Kashmiri, S. and Mahajan, V., 2022. Customer Orientation and Financial Performance: Women in Top Management Teams Matter! *Journal of Marketing* (forthcoming)

Stead, V., 2005. Mentoring: a model for leadership development? *International Journal of Training and Development*, 9(3), pp.170-184.

Starr, C.R. and Zurbriggen, E.L., 2017. Sandra Bem’s gender schema theory after 34 years: A review of its reach and impact. *Sex Roles*, 76(9), pp.566-578.

Stead, V., 2005. Mentoring: a model for leadership development? *International Journal of Training and Development*, 9(3), pp.170-184.

Taylor, E.Z. and Curtis, M.B., 2018. Mentoring: A path to prosocial behaviour. *Journal of Business Ethics*, 152(4), pp.1133-1148.

Terjesen, S., Aguilera, R.V. and Lorenz, R., 2015. Legislating a woman’s seat on the board: Institutional factors driving gender quotas for boards of directors. *Journal of Business Ethics*, 128, pp.233-251.

Tavris, C.; Staines, G.; Jayaratne, T.E. 1973 The queen bee syndrome. *Psychology. Today*, 7, 63–66.

Turban, S., Wu, D. and Zhang, L., 2019. When gender diversity makes firms more productive. *Harvard Business Review*, 11, p.17.

Ullah, I., Fang, H. and Jebran, K., 2019. Do gender diversity and CEO gender enhance firm's value? Evidence from an emerging economy. *Corporate Governance: The International Journal of Business in Society*.

Vial, A.C., Napier, J.L. and Brescoll, V.L., 2016. A bed of thorns: Female leaders and the self-reinforcing cycle of illegitimacy. *The Leadership Quarterly*, 27(3), pp.400-414.

Wang, G., DeGhetto, K., Ellen, B.P. and Lamont, B.T., 2019. Board antecedents of CEO duality and the moderating role of country-level managerial discretion: a meta-analytic investigation. *Journal of Management Studies*, 56(1), pp.172-202.

Wang, M. and Kelan, E., 2013. The gender quota and female leadership: Effects of the Norwegian gender quota on board chairs and CEOs. *Journal of Business Ethics*, 117(3), pp.449-466.

Wasburn, M. H., Wasburn-Moses, L., & Blackman, J. (2008). The P-16 strategic collaboration model: A team mentoring approach. *The Educational Forum*, 72, 32–44.

Wendt, J.L., Rockinson-Szapkiw, A. and Conway, A., 2019. Using technology to foster peer mentoring relationships: Development of a virtual peer mentorship model for broadening participation of underrepresented racial and ethnic minority women in STEM. In *Growing diverse STEM communities: methodology, impact, and evidence* (pp. 255-268). American Chemical Society.

Windchief, S. & B. Brown. 2017. Conceptualizing a mentoring program for American Indian/Alaska Native students in the STEM fields: a review of the literature. *Mentor. Tutor*. **25**: 1–17.

Wintoki, M.B., Linck, J.S. and Netter, J.M., 2012. Endogeneity and the dynamics of internal corporate governance. *Journal of financial economics*, 105(3), pp.581-606.

Withers, M.C. and Fitza, M.A., 2017. Do board chairs matter? The influence of board chairs on firm performance. *Strategic Management Journal*, 38(6), pp.1343-1355.

WomenLeaders, F., 2022. [online] Available at: <<https://ftsewomenleaders.com>> [Accessed 17 October 2022].

Zajac, E.J. and Westphal, J.D., 1996. Who shall succeed? How CEO/board preferences and power affect the choice of new CEOs. *Academy of Management Journal*, 39(1), pp.64-90.

Zalata, A.M., Ntim, C.G., Choudhry, T., Hassanein, A. and Elzahar, H., 2019. Female directors and managerial opportunism: Monitoring versus advisory female directors. *The Leadership Quarterly*, 30(5), p.101309.

Zhang, Y. and Rajagopalan, N., 2010. CEO succession planning: Finally at the centre stage of the boardroom. *Business Horizons*, 53(5), p.455.

Table A: Major differences and similarities between CEO and Board Chair responsibilities	
CEO	Board Chair
Accountable to the board of directors	Accountable to shareholders and a broader set of stakeholders together with the other board members
Responsible for implementing decisions made by the board	The highest level of decision making in the firm together with the other board members
Placed at the top of a hierarchy (formally and socially)	Leads a team of equal peers (formally and socially)
Placed at the top of a hierarchy (formally and socially)	Leads a team of equal peers (formally and socially)
Has instruction authority over subordinates	Does not have instruction authority over the other board members
Leads subordinates on a continuous basis, generally with frequent contact with subordinates	Leads board meetings that generally take place with infrequent intervals
Generally, a full-time leader	Generally, a part-time leader of the board

Table B: ASX 100 Industry Breakdown		
1.Consumer Discretionary	123	8.61%
2.Consumer Staples	140	9.80%
3.Energy	258	18.06%
4.Financials	304	21.29%
5.Health Care	116	8.12%
6.Industrials	108	7.56%
7.Information Technology	36	2.52%
8.Materials	109	7.63%
9.Real Estate	133	9.32%
10.Telecommunications	38	2.66%
11.Utilities	63	4.41%
	1428	100%

Table C: ASX 100 Industry Breakdown and woman Board Chair
. tabulate Indus Gen_BC, column

Key
<i>frequency</i>
<i>column percentage</i>

Industry	Gen_BC		Total
	0	1	
Consumer Discretionar	112 8.38	11 11.96	123 8.61
Consumer Staples	130 9.73	10 10.87	140 9.80
Energy	239 17.89	19 20.65	258 18.07
Financials	277 20.73	27 29.35	304 21.29
Health Care	111 8.31	5 5.43	116 8.12
Industrials	104 7.78	4 4.35	108 7.56
Information Technolog	36 2.69	0 0.00	36 2.52
Materials	103 7.71	6 6.52	109 7.63
Real Estate	130 9.73	3 3.26	133 9.31
Telecommunication Ser	31 2.32	7 7.61	38 2.66
Utilities	63 4.72	0 0.00	63 4.41
Total	1,336 100.00	92 100.00	1,428 100.00

Table D: ASX 100 Industry Breakdown and woman CEOs

. tabulate Indus Gen_CEO, column

Key
<i>frequency</i>
<i>column percentage</i>

Industry	Gen_CEO		Total
	0	1	
Consumer Discretion..	101 7.61	22 22.00	123 8.61
Consumer Staples	127 9.56	13 13.00	140 9.80
Energy	244 18.37	14 14.00	258 18.07
Financials	275 20.71	29 29.00	304 21.29
Health Care	116 8.73	0 0.00	116 8.12
Industrials	105 7.91	3 3.00	108 7.56
Information Technol..	36 2.71	0 0.00	36 2.52
Materials	100 7.53	9 9.00	109 7.63
Real Estate	125 9.41	8 8.00	133 9.31
Telecommunication S..	38 2.86	0 0.00	38 2.66
Utilities	61 4.59	2 2.00	63 4.41
Total	1,328 100.00	100 100.00	1,428 100.00

.

Table E: ASX100 Board Size and No. of Woman Directors	
No. of Directors (Board Size)	11701
No. of Female Directors	1428
% of Female Directors	12
No. of Female Board Chairs	91
% of Female Board Chairs	0.7
No. of Female CEOs	75
% of Female CEOs	0.6

Table F: Descriptive statistics (remove Indus)

```
. tabstat Q BoardSize fGen_BC mGen_BC BCTenure BCAGE Gen_CEO CEOTenure CEOAge CEO_Eth LOGAssets BlausIndex Shan
> nonsIndex Indus, statistics( mean sd max min sd )
```

Stats	Q	BoardSize	fGen_BC	mGen_BC	BCTenure	BCAGE	Gen_CEO	CEOTenure	CEOAge	CEO_Eth
Mean	3.537193	8.185574	.0644258	.9376751	4.553247	64.42835	.070028	4.624372	53.78584	1.030812
SD	9.489916	1.934423	.2455959	.2418295	4.71396	5.951347	.2552836	4.959868	6.056288	.1728695
Max	253.183	15	1	1	38.1	81	1	41.4	72	2
Min	-35.15994	3	0	0	0	42	0	0	28	1
SD	9.489916	1.934423	.2455959	.2418295	4.71396	5.951347	.2552836	4.959868	6.056288	.1728695

Stats	LOGAssets	BlausIndex	Shannon	Indus
Mean	6.854681	.2938641	.4359378	4.912465
SD	.8026994	.1777462	.252048	2.793031
Max	9.017101	.5277778	.6931472	11
Min	4.231215	0	0	1
SD	.8026994	.1777462	.252048	2.793031

Table G: Correlation Matrix

pwcorr Q BoardSize fGen_BC mGen_BC BCTenure Eth_BC Gen_CEO CEOTenure CEO_Eth
LOGAssets BlausIndex ShannonsIndex Indus

pwcorr, star(0.05)

	Year	BoardSize	LNBoardSize	EDs	GenMan~D	GenFem~D	fGen_BC
Year	1.0000						
BoardSize	-0.0613*	1.0000					
LNBoardSize	0.0019	0.1504*	1.0000				
EDs	-0.2696*	0.3394*	-0.0318	1.0000			
GenManNED	-0.5674*	-0.0452	-0.0530*	0.2938*	1.0000		
GenFemaleNED	0.5363*	0.0801*	0.0790*	-0.2938*	-1.0000*	1.0000	
fGen_BC	0.0610*	0.0382	0.0304	-0.0424	-0.1918*	0.1757*	1.0000
mGen_BC	-0.0507	-0.0442	-0.0268	0.0392	0.1798*	-0.1645*	-0.9825*
BCTenure	-0.0222	0.0932*	-0.0374	0.2035*	0.1684*	-0.1684*	-0.0892*
BCAge	0.1293*	0.1343*	0.0631*	0.0608*	0.0431	-0.0484	-0.1544*
Eth_BC	-0.0168	0.1005*	-0.0253	-0.0463	0.0566*	-0.0560*	-0.0272
Gen_CEO	0.0621*	0.0943*	0.0207	0.0478	0.0073	-0.0131	0.0286
CEOTenure	0.0155	0.0915*	0.0578*	0.2320*	0.0154	-0.0154	-0.0164
CEOAge	0.1030*	0.0316	0.0980*	-0.0337	-0.1618*	0.1479*	0.0914*
CEO_Eth	0.0899*	0.0311	-0.0606*	0.0337	-0.0460	0.0396	-0.0468
Q	0.0134	-0.0641*	-0.0214	-0.0018	0.0167	-0.0187	-0.0089
LagQ	0.0021	-0.0730*	-0.0372	0.0183	0.0338	-0.0348	-0.0147
ROA	-0.0590*	-0.1474*	-0.0037	0.0413	0.0967*	-0.0891*	-0.0245
Assets	0.0349	0.2946*	0.1431*	-0.0158	-0.1146*	0.1172*	0.0121
LOGAssets	0.0799*	0.6057*	0.1569*	-0.0481	-0.2704*	0.2866*	0.0773*
BlausIndex	0.5389*	0.0969*	0.0819*	-0.3287*	-0.9317*	0.8391*	0.1354*
ShannonsIn~x	0.5148*	0.1137*	0.0920*	-0.3359*	-0.9070*	0.8136*	0.1264*
Indus	-0.0201	0.0004	-0.0630*	0.0726*	-0.0075	-0.0083	-0.0633*
	mGen_BC	BCTenure	BCAge	Eth_BC	Gen_CEO	CEOTen~e	CEOAge
mGen_BC	1.0000						
BCTenure	0.0849*	1.0000					
BCAge	0.1500*	0.3734*	1.0000				
Eth_BC	0.0268	0.0062	0.0449	1.0000			
Gen_CEO	-0.0314	0.1435*	0.0076	0.1150*	1.0000		
CEOTenure	0.0160	0.2128*	0.1851*	0.0116	0.0281	1.0000	
CEOAge	-0.0856*	0.0713*	0.0810*	-0.0620*	0.0088	0.3416*	1.0000
CEO_Eth	0.0460	-0.0013	0.0037	-0.0185	-0.0013	-0.0709*	-0.0596*
Q	0.0066	-0.0325	-0.0142	-0.0208	0.0453	-0.0109	-0.0064
LagQ	0.0126	-0.0317	-0.0088	-0.0193	0.0304	-0.0112	-0.0212
ROA	0.0232	-0.0033	-0.0348	-0.0073	-0.0269	0.0004	-0.0447
Assets	-0.0142	-0.0408	-0.0083	0.0032	0.0567*	-0.0759*	-0.0810*
LOGAssets	-0.0750*	-0.0147	0.0666*	0.0648*	0.1032*	-0.0352	0.0318
BlausIndex	-0.1275*	-0.1904*	-0.0500	-0.0471	-0.0009	-0.0261	0.1418*
ShannonsIn~x	-0.1195*	-0.1941*	-0.0482	-0.0412	0.0004	-0.0249	0.1333*
Indus	0.0770*	-0.0272	0.1161*	-0.0733*	-0.0995*	0.0845*	-0.0020
	CEO_Eth	Q	LagQ	ROA	Assets	LOGAss~s	BlausI~x
CEO_Eth	1.0000						
Q	0.0211	1.0000					
LagQ	-0.0000	0.1043*	1.0000				
ROA	0.0292	0.1425*	0.1366*	1.0000			
Assets	0.1583*	-0.0507	-0.0468	-0.1345*	1.0000		
LOGAssets	0.0465	-0.1609*	-0.1367*	-0.3219*	0.6318*	1.0000	
BlausIndex	0.0315	-0.0350	-0.0504	-0.1166*	0.1395*	0.3211*	1.0000
ShannonsIn~x	0.0389	-0.0375	-0.0532*	-0.1213*	0.1415*	0.3278*	0.9939*
Indus	0.0390	-0.0601*	-0.0516	-0.0688*	-0.0845*	-0.0005	0.0167
	Shanno~x	Indus					
ShannonsIn~x	1.0000						
Indus	0.0213	1.0000					

Table H: Endogeneity Tests

womanBC

```
. estat endog
```

Tests of endogeneity

H0: Variables are exogenous

```
Durbin (score) chi2(1)      =  35.1998  (p = 0.0000)
Wu-Hausman F(1,1423)       =  35.963   (p = 0.0000)
```

ManBC

```
. estat endog
```

Tests of endogeneity

H0: Variables are exogenous

```
Durbin (score) chi2(1)      =  35.2589  (p = 0.0000)
Wu-Hausman F(1,1423)       =  36.0249  (p = 0.0000)
```

Table I: First Stage Regression (OLS)

	fGenBC	mGenBC
Gen_CEO	1.22869	1.119613
BCTenure	-0.0838961	-0.0834805
Eth_BC	-1.115106	-1.108118
CEOTenure	-0.0161166	-0.0161364
CEO_Eth	1.579967	1.586619
LOGAssets	-2.181579	-2.183723
BlausIndex	11.06137	11.02629
ShannonsIndex	-8.599827	-8.577262
Indus	yes	yes
R ²	0.0382	0.0491
F-Statistic	6.74336	6.81

. regress Q Gen_CEO fGen_BC BCTenure Eth_BC CEOTenure CEO_Eth LOGAssets BlausIndex ShannonsIndex

Source	SS	df	MS	Number of obs	=	1,208
Model	4400.90834	9	488.989816	F(9, 1198)	=	6.86
Residual	85392.3429	1,198	71.2790842	Prob > F	=	0.0000
				R-squared	=	0.0490
				Adj R-squared	=	0.0419
Total	89793.2513	1,207	74.3937459	Root MSE	=	8.4427

Q	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Gen_CEO	1.122869	1.041806	1.08	0.281	-.921099	3.166836
fGen_BC	.259559	1.05216	0.25	0.805	-1.804721	2.323839
BCTenure	-.0838961	.0543389	-1.54	0.123	-.190506	.0227139
Eth_BC	-1.115106	1.980004	-0.56	0.573	-4.999767	2.769555
CEOTenure	-.0161166	.0499696	-0.32	0.747	-.1141544	.0819211
CEO_Eth	1.579967	1.32144	1.20	0.232	-1.012627	4.17256
LOGAssets	-2.181579	.3184638	-6.85	0.000	-2.806388	-1.556771
BlausIndex	11.06137	12.45509	0.89	0.375	-13.37485	35.49759
ShannonsIndex	-8.599827	8.861486	-0.97	0.332	-25.98558	8.785931
_cons	19.08554	3.133844	6.09	0.000	12.9371	25.23397

. regress Q Gen_CEO mGen_BC BCTenure Eth_BC CEOTenure CEO_Eth LOGAssets BlausIndex ShannonsIndex

Source	SS	df	MS	Number of obs	=	1,208
Model	4405.70581	9	489.522867	F(9, 1198)	=	6.87
Residual	85387.5455	1,198	71.2750797	Prob > F	=	0.0000
				R-squared	=	0.0491
				Adj R-squared	=	0.0419
Total	89793.2513	1,207	74.3937459	Root MSE	=	8.4425

Q	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Gen_CEO	1.119613	1.04183	1.07	0.283	-.924402	3.163628
mGen_BC	-.3838474	1.072177	-0.36	0.720	-2.487401	1.719706
BCTenure	-.0834805	.0543231	-1.54	0.125	-.1900595	.0230985
Eth_BC	-1.108118	1.979994	-0.56	0.576	-4.99276	2.776524
CEOTenure	-.0161364	.0499681	-0.32	0.747	-.1141711	.0818982
CEO_Eth	1.586619	1.321374	1.20	0.230	-1.005846	4.179084
LOGAssets	-2.183723	.3184406	-6.86	0.000	-2.808487	-1.55896
BlausIndex	11.02629	12.44512	0.89	0.376	-13.39036	35.44294
ShannonsIndex	-8.577262	8.855506	-0.97	0.333	-25.95129	8.796764
_cons	19.46285	3.29434	5.91	0.000	12.99953	25.92616

Table J: Second Stage Least Squares regression

	Q (fGen_BC)	Q (mGen_BC)
Q	-90.67495**	103.985**
Gen_CEO	4.124642	4.63445
BoardSize	0.0744464	0.2019932
Indus	Yes	Yes
R ²	0.0065	0.0062
F-Statistic	6.38597	5.00645

```
. ivregress 2sls Q Gen_CEO BoardSize (fGen_BC = LOGAssets)
```

```
Instrumental variables 2SLS regression      Number of obs   =      1,428
                                           Wald chi2(3)    =       6.93
                                           Prob > chi2     =     0.0742
                                           R-squared       =      .
                                           Root MSE       =     24.097
```

Q	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
fGen_BC	-90.67495	38.9135	-2.33	0.020	-166.944	-14.40589
Gen_CEO	4.124642	2.681456	1.54	0.124	-1.130915	9.3802
BoardSize	.0744486	.375659	0.20	0.843	-.6618294	.8107267
_cons	8.480751	2.946226	2.88	0.004	2.706255	14.25525

Endogenous: **fGen_BC**Exogenous: **Gen_CEO BoardSize LOGAssets**

```
. estat firststage
```

First-stage regression summary statistics

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	F(1,1424)	Prob > F
fGen_BC	0.0065	0.0045	0.0045	6.38597	0.0116

Minimum eigenvalue statistic = 6.38597

Critical Values	# of endogenous regressors:	1
H0: Instruments are weak	# of excluded instruments:	1

2SLS relative bias	5%	10%	20%	30%
		(not available)		
2SLS size of nominal 5% Wald test	10% 16.38	15% 8.96	20% 6.66	25% 5.53
LIML size of nominal 5% Wald test	16.38	8.96	6.66	5.53

```
. ivregress 2sls Q Gen_CEO BoardSize (mGen_BC = LOGAssets)
```

Instrumental variables 2SLS regression	Number of obs	=	1,428
	Wald chi2(3)	=	5.61
	Prob > chi2	=	0.1322
	R-squared	=	.
	Root MSE	=	26.779

Q	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
mGen_BC	103.985	49.59238	2.10	0.036	6.785754	201.1843
Gen_CEO	4.63445	3.07389	1.51	0.132	-1.390264	10.65916
BoardSize	.2019932	.4493753	0.45	0.653	-.6787663	1.082753
_cons	-95.94494	48.79936	-1.97	0.049	-191.5899	-.2999481

Endogenous: mGen_BC

Exogenous: Gen_CEO BoardSize LOGAssets

```
. estat firststage
```

First-stage regression summary statistics

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	F(1,1424)	Prob > F
mGen_BC	0.0062	0.0041	0.0035	5.00645	0.0254

Minimum eigenvalue statistic = 5.00645

Critical Values	# of endogenous regressors:	1
H0: Instruments are weak	# of excluded instruments:	1

2SLS relative bias	5%	10%	20%	30%
		(not available)		
2SLS size of nominal 5% Wald test	10%	15%	20%	25%
LIML size of nominal 5% Wald test	16.38	8.96	6.66	5.53
	16.38	8.96	6.66	5.53