Master Thesis U.S.E

The influence of corporate governance on financial performances during and outside periods of financial distress

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Abstract: This thesis studies the role of corporate governance and answers the following research question: "What are the impacts of corporate governances on firms' financial performances in the US market, considering the context of corporate financial distress?". Using panel data and fixed-effects method of analysis, it examines the influence of key corporate governance variables, including gender diversity, independent board members and financial experts, on financial performance of firms in S&P 1500 in the US. It also investigates if these impacts change during the financial crisis, using the Altman Z-score model. The results show that female board members increase the return on assets - ROA and financial experts decrease ROA, for firms in financial distress. The robustness test for financial distress using the Ohlsen O-score model, however, does not support these results. Furthermore, both female board members and financial experts increase Tobin's Q for non-distress firms, while only financial experts decrease Tobin's Q for distressed firms. The percentage of independent directors have no significant influence on ROA regardless of any financial conditions, but decrease Tobin's Q for firms in financial distress. The consistency of these results was, on the other hand, validated in the O-score model. This thesis has an important contribution to the development of the current literature on the topic of corporate governance as it provides empirical evidence for the significant impact of corporate governance on improving financial outcomes for both distressed and non-distressed firms. It also offers various useful insights for a wide range of stakeholders, including shareholders, investors and policymakers on how to adopt an effective, optimized management board structure to achieve better financial results. This thesis is, however, still subject to many limitations, from which it provides a solid foundation for future studies, such as through recommendations to broaden the study scope, analyze more diverse sets of corporate governance provisions, incorporate other relevant current and historical firm characteristics and use different statistical analysis next to more reliable robustness tests for financial distress.

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Introduction

Corporate governance has recently become an important research area in the field of Finance. It is considered as a mechanism where "CEO, Board of Directors and Senior Management" manage the company (Singh et al., 2018). OECD (2004) defines the term in a broader way, as the combination of many individuals within an organization who are authorized and responsible for determining the rules and decision-making procedures. On some of the corporate governance provisions, research has shown agreement on the effects, such as board size which appears to have a positive effect on firm performance (Nguyen & Nguyen, 2024), due to better work allocation (Anderson et al., 2004; Kyere & Ausloos, 2021) and more monitoring work involved and conducted effectively (Fama & Jensen, 1983). On the other hand, CEO duality has been found to negatively influence the performance of the firms (Pandey et al., 2023). However, most research that has been done cannot reach a consensus on the magnitude and signs of several corporate governance provisions, such as gender equality, independence and financial expertise of the board. Therefore, it is important to further research corporate governance and find out what the effects of gender equality, independence and financial expertise of board members are on the financial performance and if these effects differ if the firm is in financial distress.

Various recent scandals in the media have been found to be caused by lacking appropriate and ethical corporate governance (Aggarwal & Seth, 2019). There is also an increase in the level of hostile takeovers and antisocial corporate decisions, which is believed to stem from the poor management of the companies (Rossi & Capasso, 2015). According to Rezaee (2008), good corporate governance can contribute to the health of the companies and can have a positive impact on society, such as by having the board make less risky investment decisions to benefit investors or conduct more pro-social corporate practices to improve firms' reputation and financial returns. Additionally, it is highly relevant to analyze the impacts especially when firms are under financial distress because of the most recent pandemic COVID-19 that made many firms face financial constants, significant reduction in sales and even bankruptcy (Rahmah, 2021). Global financial crises might not happen frequently, but the probability of an individual company to have financial distress is relatively high, especially when there is an increasing competition among firms that makes financial stability hard to achieve (Rossi & Capasso, 2015). For these reasons, it is important to analyze how corporate governance can benefit the development and sustainability of the firms, especially when having financial distress.

There has been significant uncertainty surrounding the three corporate governance provisions included in my analysis. Some research such as the paper by Ahern and Dittmar (2012) has shown a negative impact of more women on the board on the financial performance, while, on the other hand Pandey et al. (2023) have found a beneficial effect. Moreover, there have also been researchers who established an insignificant relationship, such as Carter et al. (2010). This variability can also be observed in the research related to board independence, where Dahya and McConnell (2007) identified a positive influence on the operating performance after increasing the amount of independent board members, while other researchers, such as Singh et al. (2018) and Farooq and Ahmad (2023) uncovered an adverse effect on the market performance and accounting performance, respectively. There is also research that fails to identify a significant relationship, such as Alzoubi et al. (2024) and Terjesen et al. (2016). Lastly, research examining the impact on the financial expertise of board members has also shown ambiguity, because the definitions used for categorizing an individual as a financial expert differ per paper. For example, Jiang and Murphy (2017) categorize a business professor

as a financial expert, while Li and Wang (2023) use top managers with a Finance background. Furthermore, financial distress carries significant costs for firms such as legal, monitoring and administrative costs, and possibly the loss of suppliers and customers (Myers, 1984). Therefore, it is of utmost importance to understand what decisions firms can take to escape financial distress.

For these reasons, this thesis aims to answer the following research question: "What are the impacts of corporate governance on firms' financial performance in the US market, considering the context of corporate financial distress?". Financial performance is examined with both an accounting-based measure - return on assets (ROA), and a market-based measure - Tobin's Q.

This thesis uses a panel data sample of S&P 1500 firms over the period from 2009 to 2022. Focusing on firms in the United States, I also exclude firms from the financial industry (SIC 6000-6999) and from the utility industry (SIC 4900-4949), because these firms operate differently than ordinary companies. The accounting data is taken from the COMPUSTAT database, and the market data is taken from the CRSP, while the board data has been retrieved from ISS ESG, which are both available on the WRDS database.

Three aspects of corporate governance are analyzed in this thesis, which are gender equality, independence and financial expertise of board members, in the context of financial distress. The first aspect, gender equality, is defined as the percentage of board members that is female. Secondly, board independence is defined as the percentage of outsiders on the board. Lastly, the financial expertise of board members is defined according to the SEC definition of financial expertise, which is then taken as a percentage of the total number of board members. Therefore, my paper seeks to answer the first sub-question: "What are the impacts of having female, board independence and financial experts in the management board on the financial performance of the firms?". Next to that, what differentiates my thesis from the current literature is that I not only assess the impacts for healthy firms, but also struggling companies – those that face situations of financial distress, such as having insufficient earnings or excessive borrowings. Financial distress in my paper does not represent the financial crisis on a large scale and only represents the situations that specifically apply to individual firms. Additionally, it has been examined using both the Z-score (Altman, 1968) and the O-score (Ohlson,1980) to gain a robust image on the effect of financial distress. These models are advantageous because Z-score and O-score can be used to assess financial distress among both rated and non-rated firms, compared to credit ratings that are limited to only rated firms. Thus, my paper also aims to answer the second sub-question: "What are the directions and magnitude of the impacts when controlling for the situation of financial distress?".

The main finding of this thesis is that, for firms in financial distress, evidence, though not being supported by robustness test, indicates that a higher percentage of financial experts leads to a lower return on assets, while a higher percentage of female board members lead to a higher return on assets. I fail to find a significant relationship between the board independence and the asset return. Moreover, the percentage of female directors appears to have a favorable impact on Tobin's Q for firms that are not in financial distress. On the other hand, the independence of the board seems to have a negative influence on Tobin's Q for firms facing financial difficulties. Furthermore, the financial expertise of the board shows a positive effect on Tobin's Q for firms not in financial distress and a negative effect for firms in financial distress. Lastly, evidence shows that distressed firms have a higher Tobin's Q than non-distressed firms. These results for Tobin's Q are confirmed in the robustness test for financial distress.

My contribution to the current literature is to examine corporate governance in the context of financial distress. Moreover, the selection of corporate governance variables that are analyzed in this thesis includes those that research has not yet shown a clear effect of. In addition, the credit rating of firms is often used as a proxy of the firm's default probability - the probability of financial distress. However, firms with credit ratings do not represent the whole population of firms because it excludes firms without a credit rating. By using Altman Z-score and Ohlson O-score, I can, on the other hand, assign a probability of financial distress to firms that are normally excluded from the credit rating model, from which I reduce selection bias, increase both sample sizes and statistical power to make results more likely to be significant. Although my thesis cannot be generalized to the whole population, its sample size of 714 firms ranging from small firms to large firms in the S&P 1500 might be large enough to represent the companies in the US itself.

More importantly, my research has contributed to information for a wide range of stakeholders. The topic of corporate governance is not only relevant for the investors and shareholders to understand which corporate governance practices firms can take to improve their financial performance, especially those without sufficient management knowledge and capabilities, but also for policy makers who can impose mandates or quotas on the board structure to benefit the stability of the whole economy. The results can also show the effectiveness of gender equality mandates, in response to the pressure from the press and the public (Adams & Ferreira, 2008), while addressing the skepticism towards the role of board independence in reducing the principal agent problems with better monitoring and objective perspectives (Klein, 1998). Lastly, it gives recommendations for the board selection procedure, specifically on the education qualifications and experience requirements for directors' appointments.

The remainder of this paper is structured as follows: It starts with the literature review and theoretical framework to motivate the studied variables. After that, the paper moves on to describe data in the data section and presents the analysis in the method section. The paper then ends with the results and discussion of the contribution, limitations, and suggestions for future studies.

Literature review

Corporate governance is an important theory in determining the management structure of firms. It stems from the agency theory stating that conflict of interest between agent and principal arises when there is a separation of ownership and control in public companies, hence impacting the performance of the companies (Eisenhardt, 1989). Agency theory believes that managers have advantages with their expertise, firm-specific understanding and management experiences compared to shareholders of the firm who have little knowledge of the firm's inner operations; they tend to take the benefits out of the firm's owners' hands (Schwartz, 1987). Therefore, effective corporate governance is necessary to align shareholders' interests with the interests of the managers to minimize the conflict of interest and improve the financial performance of the firms (Affes & Jarboui, 2023). A good board structure plays an essential role in ensuring this problem of the agency theory does not arise while increasing the public confidence in the firm (Al-Matari et al., 2013).

Female in management board and firm's financial performance

Gender equality in the management board has become an increasingly popular societal matter that receives attention from many stakeholders of a company. 87% of corporate boards have at least one female board member and there is an upward trend in the percentage of females being on board despite the decreasing board size in 1990 (Farrell & Hersch, 2005). This effect comes from the increasing pressure to choose female directors for higher gender diversity in the boardroom (Adams & Ferreira, 2008).

Besides the pressure from regulators who fight for gender equality, the authors argued that having more women on the board can improve the corporate governance and financial performance in a meaningful way. They believe that women are more likely to be involved in monitoring and strategy-making than men, hence potentially reducing agency costs and improving business outcomes, similar to the findings of Post and Byron (2015). Women are also likely to attend higher education and hold a higher level of education degrees (Carter et al., 2010), at the same time they are more excellent in advertisement and sales than male (Groysberg & Bell, 2023). Although women often have less CEOs experience and a more non-business background (Hillman & Harris, 2002), they might have deeper insights into the consumer markets due to their daily routines of purchasing household-related things (Bilimoria & Wheeler, 2000).

On a different psychological perspective, Adams (2016) argued that women and men with different cognitive frames can possess different core values and risk preferences which impacts the decision-making process, hence influencing corporate outcomes. For example, women are found to be more cooperative while males tend to stick to the rules, regulations, and traditions limiting flexibility (Bart & McQueen, 2013). Gender equality in the board not only reinforces the shareholder theory by improving financial performance, but also supports stakeholder theory because it represents pro-social activities and higher levels of corporate social responsibility from the management board that help gain stakeholders' approvals and in return receiving better business results (Galbreath, 2016).

Many research papers have analyzed the impact of having women in the management board but there are still controversies around this topic. Pandey et al. (2023) has found a positive effect of gender diversity on firms' market performance in combination with other firms' characteristics, including leverage, firm size, CEO duality. Another research paper found a more complicated result since at first, female directors improve the operating performance and the firm market value due to substantial effort in monitoring (Adams & Ferreira, 2008). However, this relationship disappears in the long term and firms on average perform worse than before introducing gender diversity, potentially because of over-monitoring and resistance to takeovers. Gender diversity might also lead to having younger and less experienced board members that deteriorates operating outcomes with evidence shown in the ineffectiveness of Norway's 2023 mandating of at least 40% female representation on corporate boards (Ahern & Dittmar, 2012).

On the other hand, some research believes that gender diversity does not destroy nor create any values (Carter et al., 2010) despite the suggestions from agency and psychological theory. Better operating firms are more likely to add women on board due to higher pressure from the public so the benefits it brings to the companies are still not completely known (Farrell & Hersch, 2005). Lastly, some impacts are inconsistent among different performance measurements. For example, positive effects are found on the operating performance but not necessarily on the market performance of the company (Post & Byron, 2015).

Therefore, it is important to analyze the effect of gender diversity because it can establish a solid basis for supporting the governance advocacy for these pro-social behaviors. This paper could address the skepticism towards the contribution of female directors to corporate results. However, since most of the current literature, but not all, believes that a positive relationship exists between the percentage of female board members and the financial performance of firms, I can hypothesize that:

Hypothesis 1: The percentage of female board members has a positive influence on the financial performance.

Board independence and firm's financial performance.

Board independence relates to the number of board members not employed by the company or the outsiders of the company. The board of directors is often the main monitoring mechanism within a firm with the purpose of maximizing shareholder value (Fama & Jensen, 1983). This monitoring goal is based on the agency theory emphasizing that without proper monitoring, agents might not act for the principal's best interests since managers prefer maximizing their own utility rather than the shareholders' wealth (Eisenhardt, 1989). Therefore, having directors from outside the firm helps reducing asymmetric information, increasing transparency and gaining more objective perspectives (Klein, 1998) because they are completely independent of the management, do not face conflict of interest (Dalton et al., 1998) and are more likely to protect the benefits of the shareholders compared to internal executive board members (Volonte, 2015). Additionally, the non-management directors have distinct advantages, including a diverse set of knowledge, a broader perspective and a wide range of outsider contacts compared to insiders, which benefits the management practices and corporate results (Pfeffer, 2019). Past research has shown a positive improvement in the operating effectiveness in the UK firms after introducing outside directors to the management board compared to the peer group benchmark (Dahya & McConnell, 2007).

There is also a significant increase in the stock prices immediately after companies announce their outsider CEOs, indicating a better market performance. This result is similar to the findings of Rehman et al. (2021) in which the authors focus on the impact of the audit committee's independence within the board.

However, there are contrasting arguments from the stewardship theory indicating that inside directors are preferable compared to non-management directors, so the control should be in the hands of the managers (Donaldson, 1990). The author believes they are more trustworthy and committed to the companies, hence will not use resources inappropriately without care. In another paper, Donaldson and David (2019) also argued that managers are believed to be loyal stewards of the company and they, without doubts, work hard for positive results for the firm and shareholders' returns. Furthermore, independent board members are not fully supported because some researchers doubt the true independence level of these members. By being on the board, outsider directors still have a close relationship with the insiders, and they do not often raise their voice to critical matters, contrary to expectations, especially in developing countries (Singh et al., 2018). They might also be distracted by their external activities and show less commitment to the internal activities, which consequently leads to lower performance (Volonte, 2015). There are papers supporting these claims by concluding that a high level of board independence can lead to a negative impact on the firms' market performance (Singh et al., 2018); (Volonte, 2015). Even when investigating the operating profitability instead, there is still an inverse relationship between these two factors (Farooq & Ahmad, 2023).

On the other hand, some findings are insignificant, showing no association between the independence of the board and financial performance at all (Alzoubi et al., 2024). Terjesen et al. (2016) did a multi-country analysis on the effect of board diversity on financial performance using the return on assets and Tobin's Q. They only found a significant impact of the independence if the board was gender diverse, which, however, is often not the case. Furthermore, Garg (2007) explained his findings of an insignificant relationship as being due to the shortage of qualified candidates available to become an independent director, making the director not being fully independent but holding an executive position at another company.

Because of the controversial results of previous studies, this paper will analyze this aspect of the corporate governance, to solve the gap and investigate the direction of the impact board independence has on firms' financial performance, including both operating profitability and market performance. Most of the literature either finds a positive or negative relationship, while only a small part of the researchers finds an insignificant impact. Since the literature is nearly equally split between positive and negative relationships, my hypothesis is that:

Hypothesis 2: Board independence has a significant influence on firms' financial performance.

Financial expert and firm's financial performance

Having financial experts on the board has been investigated by many researchers. The motivation for including professionals who have financial expertise and experience comes from the belief in their capabilities to add more value than just merely prevent losses (Daily & Cannella, 2003). Strong financial expertise is also an indication for quality management, and it has been proven that firms that have corporate governance pursuing not only survival but also excellence consistently observe improvement in financial values and shareholder values (Charitou et al., 2017).

Additionally, due to many high-profile accounting scandals of large corporations, it is important to the Securities and Exchange Commission (SEC) that firms include financial experts on the audit committee within the management board so that the shareholder interests are protected, since the shareholder value is enhanced with more precise financial reporting processes (Defond & Hu, 2005). A director is considered to have financial expertise when he or she has acquired previous accounting-related practices as a "public accountant, auditor, principal financial or accounting offer or controller" and specifically has experience with SEC financial reporting requirements since it requires a high level of accounting practices (Defond & Hu, 2005). The authors found that assigning accounting financial experts to the audit committees has strengthened the corporate governance and, thereby, received positive reaction from the markets, enhancing the market performance of firms and improving shareholder values. However, these findings are limited to the definition of a financial expert as only having accounting-based expertise. Another paper showed that the presence of financial experts in the audit committee decreases agency conflicts and information disparity between the management and shareholders (Hassan, 2022). This contribution, in return, boosts the performance of the firms non-listed in the financial market.

Some other research does not limit the definition of a financial expert to only accounting-based expertise but also extends it to a general career background in finance. Top managers with career experience in finance are found to lower the cost of equity issuance, facilitate debt financing, improve firms' performance, and minimize investment inefficiency by having project-specific instead of company-wide perspective (Li & Wang, 2023). Additionally, financial experts can utilize private information more effectively to set CEO bonuses, which indirectly enhance the business outcomes (Liu & Sun, 2022). On the other hand, other papers define financial experts as having a background in academia, such as by being finance or business professors. Although this definition does not indicate the directors' level of industry experiences, it is still a valid indication of their capabilities and excellence. Business professors are more likely to be independent and critical with their own judgment and not easily influenced by others which might lead to better decisions than other directors (Jiang & Murphy, 2017). They also often have very different perspectives and approaches to a problem than the remainder of the board, adding diversity to the solutions (Francis & Wu, 2015). He found a positive influence of academic directors on both operating performance and market performance because these professors attend board meetings and monitoring-related committees more frequently, while holding more committee memberships than other board members, thereby contributing to the innovation level of the firm. However, he also argues that academic expertise might not translate very well to the real business world, so their impacts are not as strong as it could have been since it might be harder for academic directors to reach a sound business suggestion.

Yang et at. (2021) shares the same findings of the negative impacts from the financial expert. CEOs with previous financial experiences unintentionally hinder innovation and undermine firms' performance due to the crowding-out effect of additional financial investment and diminished R&D expenditure.

Given the variety of the definitions of a financial expert and the limited amount of research studying on both academic background and industry experience, my paper will examine the role of financial expert based on the definition of the SEC, because it is widely acceptable and a sufficient indicator for both education and working experience level. It is also highly crucial for firms to perform high-quality reporting as a solid foundation for understanding, thereby improving the financial health of the company, particularly in response to many business scandals. While there is uncertainty about which definition of a financial expert one should use when analyzing firms, most of the research is positive about the impact of the percentage of financial experts on the board. This analysis leads me to the following hypothesis:

Hypothesis 3: Financial experts have a positive influence on firms' financial performance.

Financial distress and firm's financial performance

Financial distress has a significant impact on firms' financial performance. Financial distress is often caused by high leverage levels taken by the company, such as to invest in research and development (Opler & Titman, 1994). According to the author, financial distress can easily happen, especially during the economic downturn as firms observe not only a significant decline in sales, but also in the market value of equity. Another paper also confirmed the negative relationship between financial distress and corporate performance and emphasized the vulnerability of companies during financial distress or, in the worst case, financial crises (Wu et al., 2020). The author stated that during these difficult periods, firms are likely to adopt poor financial structure with excessive debt levels as managers who face the conflict of interests tend to make more risky business decisions and place the whole company at financial risk. Therefore, good corporate governance is more essential than at any other time to minimize related risks and avoid this distressed situation. Each firm with a different corporate board is proven to produce different performance during a financial distress or global crisis (Francis & Wu, 2012). Consequently, a situation of financial difficulty allows researchers to observe the impact of corporate boards on the firm value more easily, especially when this situation calls for boards' proactiveness compared to during good times (Francis & Wu, 2012).

Many papers have argued that compared to normal situations, the role of gender diversity in the boardroom is more essential when the company drops below the critical financial distress threshold because there is a pressing need to carefully monitor the firm performance and receive new advice from different perspectives (Papangkorn et al., 2021). The authors find a positive impact of female directors on the operating outcomes during the great recession. However, this relationship is not observed outside the period of economic downturn and the stock market. The advantages of providing different perspectives during economic hardship that gender equality offers to the management board are also confirmed in other papers. Women provide more distinct management experiences and deeper stakeholder understandings, enabling the board to make tough and counter-cyclical investment decisions during the crisis of 2007 – 2008 (Sun & Ye, 2015). Not only do female directors improve the corporate governance effectiveness through better supervision and resources allocation, but they also reduce the probability of a firm facing bankruptcy (Muthia & Andaiyani, 2024); (Guizani & Abdalkrim, 2023).

The covid-19 crisis has shown a strong positive correlation between female percentage on board and firm performance, and a greater presence of female executives correlates with a lower risk of firms encountering financial distress (Lee & Thong, 2023). This observation aligns with the findings of García and Herrero (2021) and Shahwan (2015). Prior results mostly suggest a supportive relationship between female board membership and firm performance in financially distressed firms. Based on preceding discussion, I propose the following hypothesis:

Hypothesis 4a: The percentage of female board members has a positive influence on firms' financial performance, in the context of financial distress.

There is also evidence that firms are more likely to appoint external directors and enhance board autonomy during times of inferior performance since the executive board seeks for an improvement in the financial status of the company (Hermalin & Weisbach, 2003). Additionally, if the outside directors precede the current CEOs, the impact of this independence level on firms' market performance are significantly positive because CEOs cannot get involved in the selection of these external directors to maintain their power by reducing board independence level (Francis & Wu, 2012). However, a paper found no significant associations between the board independence and firms' performance (Hazami-Ammar & Gafsi, 2021) and another paper, while sharing the same result of the insignificant impacts, emphasizes that having independent directors can serve as a mediator to decrease the likelihood of firms falling into financial distress as demonstrated by the financial crisis of 2015 (Guizani & Abdalkrim, 2023). Higher board independence level correlates with a lower total risk level of the firm (Minton & Williamson, 2014). When it comes to distressed firms specifically, most of the research surrounding the topic of independent directors finds a positive relationship. Accordingly, I propose the following hypothesis:

Hypothesis 4b: Independent directors have a positive influence on firms' financial performance, in the context of financial distress.

Lastly, financial experts are found to play an important role during financial distress. CEOs with financial expertise enhance value creation of the spin-off procedures, thereby improving the operating performance of the company (Kim & Yoon, 2023). Another paper also confirms a significant impact of financial experts on firm performance, while emphasizing on the contribution of the outside financial experts, because they understand the financial information thoroughly and have more effective monitoring capabilities than insiders (Francis & Wu, 2012). Meanwhile, Minton and Williamson (2014) perform the analysis and realize that the financial expertise among independent directors is weakly, positively correlated with firms' financial performance before the crisis but negatively afterwards. To satisfy the shareholders, these directors overly depend on their experience in the financial industry and take excessive risks before the crisis, which consequently leads to a lower firm value later during the crisis, especially within large financial institutions like banks. Nevertheless, most of the research indicates a favorable association between the percentage of financial experts on the board and the performance of the firm in the context of financial distress. Considering these findings, it is hypothesized as follows:

Hypothesis 4c: Financial experts have a positive influence on firms' financial performance, in the context of financial distress.

Previous research on this topic focuses mainly on the global recessions, such as the period of 2007-2008, the great recession or the Covid-19 pandemic, while little attention is given to individual corporate financial distress. While financial crises might bring firms into financial distress, the reverse relationship does not necessarily hold. It is essential to analyze how corporate governance functions during the period of financial distress because this scenario is more common than a global recession and effective corporate governance can add significant value to these firms. Additionally, most research focuses on the impact of corporate governance on the likelihood of financial distress rather than the firm's performance when the financial distress already happened. Therefore, my paper will fill in the research gap by analyzing the role of these corporate governance aspects over a long period of time, which includes the period before and after when firms go into financial distress. While not many papers have focused on the impact of financial distress on financial performance, the literature that does exist surrounding the subject of financial distress suggests that financial distress negatively impacts financial performance. This analysis suggests the last hypothesis:

Hypothesis 4d: Financial distress has a negative influence on firms' financial performance.

Data

This paper collects data using secondary data from ISS for board characteristics data (2014), Compustat for computing the return on asset that measures the accounting performance of the companies, and CRSP for computing Tobin's Q that measures the market performance of the firms. My sample consists of companies included in the S&P 1500 index, which is the combination of S&P 500, S&P MidCap 400, and S&P SmallCap600. I group all different share classes of a firm into one data entry for that specific firm, using a company identifier (GVKEY), so the number of firms that provide valid data to be analyzed is 714. I choose this index for a large sample size and good market representation because it covers not only small and medium firms but also ones with large market capitalization, representing approximately the majority of the US equity market, hence, being a comprehensive benchmark for the US economy. Furthermore, the data are collected over 14 years from 2009 to 2022 because an extensive timespan offers higher chances of firms entering and recovering from financial distress. As this thesis wants to isolate the external economic influences and only focus on the financial distress experienced by individual firms, the timeframe for this study starts from 2009 to avoid the global recession of 2007-2008 that affects every firm. This time range makes it easier to distinguish the impact of board characteristics on financial results from the influences of the global financial crisis in 2008.

By using this data sample, I aim to analyze the impact of corporate governance on firms' financial performance. Therefore, the dependent variables represent the financial performance of the companies. My paper analyzes the financial performance using two measures: Tobin Q's and Return on Assets (ROA). Tobin Q is relevant because it emphasizes the main size goal of the firms, which is to maximize the market values (Venkatraman & Ramanujam, 1986). Additionally, in case there are any changes in the accounting rules during the analysis period, Tobin Q will provide more reliable results than the ROA measures (Ahern & Dittmar, 2012). This method is also widely used in earlier publications about firms' financial performance, such as Pandey et al. (2023), Francis and Wu (2015), Aggarwal and Seth (2019). On the other hand, it is still necessary to include another way like ROA when assessing the performance since the impact of board characteristics might be different between measurements. For example, the percentage of women on the board is positively correlated with ROA while negatively associated with Tobin Q's (Adams and Ferreira, 2008). It is essential to study both measurements, since one focuses on the internal efficiency and profitability of the firm - ROA, while the other offers information about the market perception, hence, expected growth of the company – Tobin's Q. Therefore, analyzing these two measurers offers both internal view and external view of the firms.

The following tables shows the operationalization of the key concepts in my paper:

Dependent Variable	Computation	Representation	Relevant literature
ROA	$\dfrac{Net\ income}{Total\ asset}$	Return on asset for accounting performance	Farrell and Hersch (2005); Ahern and Dittmar, 2012); Dahya and McConnell (2007), Vafeas (1999).
Tobin's Q	$\dfrac{Market\ Value}{Book\ Value}$	Market financial performance	Pandey et al. (2023), Francis and Wu (2015, Aggarwal and Seth (2019).

The independent variables, on the other hand, are the characteristics of corporate governance, including the role of females on management boards, board independence, the presence of financial experts on executive boards and the context of financial distress.

Firstly, the measurements for corporate governance are as follows:

Independent Variable	Computation	Representation	Relevant Literature
Female percentage	$\dfrac{Number\ of\ female}{Board\ size}$	Female on management boards	Farrell and Hersch (2005); Adams and Ferreira (2008); Post and Byron (2015); Pandey et al. (2023); Ahern and Dittmar (2012)
Independent percentage	$\dfrac{Independent\ board\ members}{Board\ size}$	A board member who is not also the manager of the firm, showing board independence level	Dahya and McConnell (2007); Rehman et al. (2021); Donaldson (1990 & 2019); Singh et al. (2018); Farooq and Ahmad (2023); Alzoubi et al. (2024).
Financial expert percentage	$\dfrac{Number\ of\ financial\ experts}{Board\ size}$	Financial expert on management boards	Defond and Hu (2005); Hassan (2022); Francis Wu (2015); Yang et al. (2021).

Additionally, the financial distress condition is measured in two ways. The first measurement method is to use Z-score since it is a good indicator for financial distress and the higher the Z-score, the lower the chance of financial distress (Shahwan, 2015). It is advantageous to utilize Z-score as it has been used many times in the research surrounding the estimation of financial distress. The firm is in financial distress when Altman Z-score is under 1.88 since the firm will go bankrupt (Altman, 1968). Therefore, the financial distress is a dummy variable where it takes on 1 if Z-score is lower than 1.88 and it takes on 0 otherwise. Z score is computed as:

$$Altman\ Z-score = 1.2 * x_1 + 1.4 * x_2 + 3.3 * x_3 + 0.6 * x_4 + x_5$$

$$\text{Where } x_1 = \frac{Working\ capital}{Total\ assets}, x_2 = \frac{Retained\ earnings}{Total\ assets}$$

$$x_3 = \frac{Earning\ before\ interest\ and\ tax\ (EBIT)}{Total\ assets}, x_4 = \frac{Market\ capitalization}{Total\ liabilities}, x_5 = \frac{Sales}{Total\ assets}$$

As Altman decides on the threshold for financial distress based on personal judgment, next to a small sample size consisting of only manufacturing firms from his old research paper, a robustness check is needed. This thesis includes a second way to measure financial distress: Ohlson O – score to achieve a more reliable result and investigate whether the impact of corporate governance on the financial performance of firms differs per measurement method.

$$O - score = -1.32 - 0.407 log\left(\frac{TA_t}{GNP}\right) + 6.03\left(\frac{TL_t}{TA_t}\right) - 1.43\left(\frac{WC_t}{TA_t}\right) + 0.0757\left(\frac{CL_t}{CA_t}\right)$$
$$- 1.72X - 2.37\left(\frac{NI_t}{TA_t}\right) - 1.83\left(\frac{FFO_t}{TL_t}\right) + 0.285Y - 0.521(\frac{NI_t - NI_{t-1}}{|NI_t| + |NI_{t-1}|}$$

Where TA = total assets, GNP = Gross national product. Taken from federal reserve data, TL = Total liabilities, WC = working capital, CL = current liabilities, CA = current assets, NI = net income, FFO = funds from operations. FFO is originally an old measure that is not used anymore. Therefore, I replace it with the readily available oancf value, which is net cash flow from operations. Lastly, X = 1 if TL>TA, otherwise 0 and Y = 1 if there is a net loss for the two previous years, otherwise 0.

The coefficients for O-score were determined by a logistic regression (Ohlson,1980). The outcome ranges between 0 and 1, which means O-score directly represents the probability of financial distress. I use 50% chance as the cut-off, which means that when the probability (outcome) of the O-score model is larger than 0.5, the financial distress variable is classified as 1 and 0 otherwise. O-score might be more realistic than Z-score because the sample data computing Z-score was released after the firms were bankrupt, hence potentially overestimating the probability of financial distress. Moreover, O-score might be better at capturing size effects because of the log-normalization of the total assets that does not take the absolute values of the total assets. It also captures the time effect since the last components of the formula are related to the net income, combined with Y capturing effects over time. Therefore, it is essential to include O-score for a robust check purpose.

Lastly, to analyze if gender equality, board independence and financial experts have even stronger effect on the firm's business outcomes specifically in the context individual financial distress, I use interaction term as follows:

Independent Variable	Computation	Representation	Relevant Literature
Female percentage x financial distress	Interaction term with financial distress	Impact of having gender diversity in management board during financial distress	Papangkorn et al (2021); Sun and Ye (2015); Muthia and Andaivani (2024); Guizani and Abdalkrim (2023); Muien and Badru (2023).
Independent percentage x financial distress	Interaction term with financial distress	Impact of board independence during financial distress	Francis and Wu (2012); Hazami-Ammar & Gafsi (2021); Guizani and Abdalkrim (2023).
Financial expert percentage x financial distress	Interaction term with financial distress	Impact of including financial experts in management board during financial distress	Kim and Yoon (2023); Francis & Wu (2012); Minton and Williamson (2014).

Besides the dependent variable and the main independent variables, the paper also includes control variables to avoid omitted variable biases. These control variables either represent other board characteristics or other important characteristics of the firms that also might have a significant impact on the financial performance of the companies. All these variables have been analyzed thoroughly by prior studies. Therefore, this paper will not dive deep into these impacts. The paper also controls for the impact of COVID-19 to avoid biased results. Control variables are presented as follows:

Control Variable	Computation	Representation	Relevant Literature
CEO duality	Duality = 1 if one person has the job title as CEO and Chairman, 0 otherwise	CEO is also the chairman of the management board	García-Ramos and Díaz (2021); Farooq and Ahmad (2023), Grove et al. (2011).
Board size	Number of people on the board Female = 1, otherwise 0 and Male = 1, otherwise 0 $Board\ size = female + male$	The size of the management board	Singh et al. (2018); Alzoubi et al. (2024); Coles et al. (2008), Grove et al. (2011).
Log size	The logarithm of the firm's total assets	The size of the firm as a whole	Minton and Williamson, (2014), Francis and Wu (2012).
Tangibility	$Tangibility = \dfrac{Total\ asset - intangible\ asset}{Total\ asset}$	Amount of tangible assets within a firm	Iltas and Demirgunes (2020); Irungu et al. (2018); VanderPal (2015).
Leverage	$Leverage = \dfrac{Total\ debt}{Debt + Equity}$	Amount of debt within a firm	Pandey et al. (2023), Minton and Williamson (2014), Francis and Wu (2012), Iltas and Demirgunes (2020), Grove et al. (2011).
Covid	1 if year is 2020 or later, 0 otherwise	The effect of the Covid-19 pandemic on financial performance	Periokaite and Dobrovolskiene (2021), Kabir and Saleh (2020), Nguyen (2022).

Other than all the characteristics described above, which are included as dependent, independent and control variables, I do not include any other aspects of corporate governance. This is due to the limitations in the databases offered by Utrecht University, as the only dataset that was available for the board characteristics is the ISS ESG.

Methodology

I used panel data to test the impact of corporate governance characteristics on financial performance. Panel data is useful when it comes to observing multiple firms over a long period of time as it controls for unobserved heterogeneity among firms that do not change over time (Arellano, 2003). Panel data only takes the differences of a firm overtime into consideration. Using panel data can improve measurement error because it investigates how changes of independent variables impact the dependent variable across various firms over time.

Regarding the methodology, we have two regression models with one model using ROA and the other using Tobin Q to measure financial performance. Additionally, for each model, the paper tests the financial distress first using Z-score and then O-score.

Regression for accounting performance:

$$ROA = \beta_0 + \beta_1 Female\ percentage\ + \beta_2 Financial\ expert\ percentage$$
$$+ \beta_3\ Independence\ percentage + \beta_4 Financial\ distress$$
$$+ \beta_5 Female\ percentage\ x\ Financial\ distress$$
$$+ \beta_6 Financial\ expert\ percentage\ x\ Financial\ distress$$
$$+ \beta_7 Independence\ percentage\ x\ Financial\ distress + \beta_8 size$$
$$+ \beta_9 Leverage + \beta_{10} Tangibility + \beta_{11} CEO\ Duality + \beta_{12} Covid$$

Regression for market performance:

$$Tobin\ Q's = \beta_0 + \beta_1 Female\ percentage\ + \beta_2 Financial\ expert\ percentage$$
$$+ \beta_3\ Independence\ percentage + \beta_4 Financial\ distress$$
$$+ \beta_5 Female\ percentage\ x\ Financial\ distress$$
$$+ \beta_6 Financial\ expert\ percentage\ x\ Financial\ distress$$
$$+ \beta_7 Independence\ percentage\ x\ Financial\ distress + \beta_8 size$$
$$+ \beta_9 Leverage + \beta_{10} Tangibility + \beta_{11} CEO\ Duality + \beta_{12} Covid$$

After having the regression, I perform the Hausman test to check which analysis method is the most suitable for the panel data in my study, considering between fixed effect and random effect method. My hypothesis is:

$$H_0 : E(a_i\ |Female\ percentage, ..., Covid)\ =\ 0\ \text{(Random effects is preferred)}$$
$$H_1 : E(a_i|Female\ percentage, ..., Covid) \neq 0\ \text{(Fixed effects is preferred)}$$

The detailed test is carried out on Stata and shown in ***Table 4*** in the appendix. Overall, the p-value is equal to 0.00, smaller than the significance level of 0.05. Therefore, the null hypothesis is rejected, and the most suitable analysis method is the fixed effect model. Fixed effects have been used in various previous research works as well, such as Adams and Ferreira (2008).

Based on the arguments of the literature review, I expect coefficient β_1, β_2 to be significantly positive, similar to coefficient β_5, β_6, β_7. Meanwhile, β_4 is predicted to be negative, while β_3 can take on either a positive or negative value and is expected to be significant. These impacts should appear in both accounting performance ROA and market performance Tobin Q's. For the control variables, β_8 to β_{12} should be significant as log size, leverage, tangibility, Covid 19 and CEO duality are proved by many findings of previous publications to significantly influence firms' profitability and market values.

Result

Dependent variables are described in the following table:

Variable	Max	Min	Mean	Interpretation
ROA	1.40	-2.51	.05	Some firms experience financial losses while some others observe profitability. Although there is a large variability among the firms, most firms manage to generate positive returns from their total assets.
Tobin's Q	123.85	.48	2.29	Regarding the market value, some firms are valued significantly higher than their original costs while some others experience lower valuation, implying poor market perception. On average, firms are valued more than twice their book value, showing moderate performance and positive investor confidence.

Independent variables are described in the following table:

Variable	Max	Min	Mean	Interpretation
Log size	13.18	2.04	8.31	Firms' size varies significantly across the dataset.
Tangibility	1	.08	.76	Most firms have a large proportion of tangible assets. None of the firms has only intangible assets.
Leverage	.99	0	.22	Most firms have low leverage levels. There are firms being fully financed without leverage.
Duality	.50	0	.06	Few firms have duality roles. There are firms with no duality on the board.
Board size	23	3	9.44	Most firms have a board size of around 10 people.
Covid	1	0	.34	34% of the observations are from 2020 onwards.
Female percentage	.67	0	.21	There is a low level of female representation on the board. Boards without the presence of females do exist.
Independence percentage	1	.25	.81	There is a high level of board independence with a maximum level reaching 100%.
Financial expert percentage	1	0	.51	There is a moderate presence of financial experts on the management board. Some boards include all financial experts while there are boards with no financial experts.

Based on the *Table 1* in the Appendix the highest correlation is between the percentage of female board members and covid, which is 0.4743. However, this is not sufficiently high to conclude on multicollinearity. The OLS assumptions are then not violated, so there is no need to exclude any of the variables from my regression models.

Additionally, the correlations between the models used in my paper (Z-score, O-score) and the credit-ratings model are presented below:

	Z-score	O-score	Credit-ratings
Z-score	1.00	0.5735	0.0698
O-score	0.5735	1.00	0.0131
Credit-ratings	0.0698	0.0131	1.00

The correlation between Z-score and the most recent S&P credit ratings is 0.0698, and the correlation between O-score and the most recent S&P credit ratings is 0.0131. These correlations lay close to zero, indicating that the Z-score and O-score model estimate the financial distress differently than the credit ratings model. It can be explained that while the credit ratings incorporate qualitative information and market confidence into the rating of a firm, Z-score and O-score only consider financial data.

As the coefficients do not change, I used models with robust standard errors due to heteroskedasticity. If the p-value is greatly larger than a significance level of 0.05, the coefficients are considered insignificant.

Accounting performance – ROA

Firstly, I will discuss the model measuring financial performance with ROA. The regression output can be found in *Table 2* in the Appendix. According to the F-test, all variables jointly significantly influence the return on assets with a p-value of 0.00. All independent variables explain 14.74% variation (R-squared) in the accounting performance of the firms. Regarding the control variables, like the findings of previous studies found in the *Data* section of the thesis, the size of the firm, tangibility and leverage have a significant impact of 2, 10 and –19 percentage points respectively. Larger firms with higher tangible assets and lower debt level have better asset profitability. However, unlike previous literature, duality, board size and Covid on the other hand do not show any significant results with p-values equal to 0.88, 0.34 and 0.65 respectively.

Moreover, looking at the main variables, I can observe that although financial distress does not directly show an influence that rejects hypothesis 4d, the presence of female and financial experts does have an impact on the return on assets during financial distress. A 10-percentage point increase of the number of women on the board improves the returns on assets by 0.6 percentage points ceteris paribus, confirming hypothesis 4a. On the other hand, a 10-percentage point increase of the financial experts decreases the return on assets by 0.4 percentage points ceteris paribus, in contrast to hypothesis 4c. However, outside of this difficult time, both the percentage of female board members and financial experts do not generate any significant impacts, which contradicts hypothesis 1 and 3. Moreover, no significant impacts were observed for a higher independence level of board members for both firms in financial distress and not in financial distress, rejecting hypothesis 2 and 4b. In general, none of the effects are strong. The largest impacts belong to leverage level (-0.19), closely followed by tangibility (0.10) and gender equality (0.06). The smallest impact belongs to independent board members when it comes to board characteristics.

Market performance – Tobin's Q

Secondly, I will discuss the model measuring financial performance using Tobin's Q. The regression output of this model can be found in *Table 3* in the Appendix. This model has a

higher R-squared of 19.69%, implying that corporate governance explains the variation in Tobin's Q slightly better than in ROA. Regarding control variables, there are similarities in the results compared to the ROA model. Duality, board size and covid still have insignificant impacts while the opposite still holds for tangibility and leverage: firms with more tangible assets and lower leverage still have a significantly better financial performance. Using a different measurement method, these impacts now have even larger coefficients of 1.26 and -2.39, respectively. On the other hand, the size of firms no longer exerts a significant influence.

Regarding the main variables, financial experts improve Tobin's Q by 0.68 but decrease it by 0.51 when the firm is in financial distress, making the findings different from the ROA model where only negative impact under financial distress was found. These findings align with hypothesis 3 and fail to confirm hypothesis 4c. Moreover, in contrast with the ROA model, a 10-percentage point increase in the female board members improves Tobin's Q by 0.077 ceteris paribus but does not exert any influence under financial distress conditions, supporting hypothesis 1 while rejecting hypothesis 4a, respectively. In terms of independence board members, since they do not have any influence on ROA under any circumstances, they also have no general impact on Tobin's Q which contradicts hypothesis 2. However, the difference lies in its negative impact on the Tobin's Q of 0.72, specifically during financial distress time with a 10% significant level, as predicted by hypothesis 4b. This means that, when the ratio of independent directors increases by 10 percentage points, Tobin's Q decreases by 0.072. Lastly, different from the ROA model, financial distress now has a direct, positive influence on Tobin's Q at a 10% significant level. Firms in financial distress have a Tobin's Q that is 0.6 higher than those of firms not in financial distress, which rejects hypothesis 4d.

Compared to ROA, this model has a higher R-squared of 19.86%. Variables that are significant all have larger coefficient sizes in the Tobin's Q model than in ROA, implying that if there are any impacts, board characteristics are more influential upon firms' market value than the operating performance. The largest impacts still center on leverage and tangibility, while the smallest impact now belongs to financial experts under the financial distress situation (0.59).

Robustness tests

Furthermore, I test the reliability of the ROA-model using O-score as another measurement for financial distress and observe both similar and different results. The results can be found next to the results of the Z-score in *Table 2* for the ROA and *Table 3* for Tobin's Q in the Appendix. The order of coefficient sizes remains consistent. While the control variables show comparable results regarding coefficient signs and significance levels, leverage does experience a marginally larger impact (-0.23 vs -0.19). Furthermore, all characteristics of corporate governance, especially financial experts and female board members no longer have significant impacts during financial distress. For non-distressed firms, although independent and female board members still do not show any influences, it is important to notice that financial experts now have a negative impact of 0.02.

For Tobin's Q, all findings are similar, even the fact that financial distress and independence for distressed firms are only significant at 10% significance level. The size of coefficients slightly differs, but the impacts directions and magnitudes remain the same.

Discussion

Based on the results, this section is to discuss the implications of the research to increase firms' financial performance. The first part focuses on implications related to the ROA – the accounting financial performance. The second part then discusses the implications for the market value of the firm. At the end, this section discusses recommendations for future studies and an outline of the limitations.

Accounting performance – ROA

Regarding the ROA model, the implications are that for companies that are in financial distress, having higher gender equality or in other words increasing female directors significantly increases the return on assets, and having more financial experts decreases the return on assets. However, when using the O-score instead of Z-score model, these relationships were not found. The only relationship that is noticeable is between financial experts and the return on assets for firms but not in financial distress. Overall, the negative effects of having financial experts are evident in both models and regardless of the financial conditions. Furthermore, having more or less independent directors on the board does not seem to have an effect on the return on assets at all.

The results align with some of the findings in previous literature. The negative coefficient for financial experts is consistent with the paper by Yang et al. (2021). Yang et al. (2021) argues that financial experts due to their possible irrelevant slow down innovations and overspend on financial investments can lead to a crowd-out effect hence poor operating profit. Moreover, a possible explanation for the deviation from literature that finds a positive relationship like Hassan (2022), could be that the definition of a financial expert is subject to various contexts. Even though both Hassan and I define financial experts as having accounting-based expertise, Hassan (2022), for example, looked at financial experts on the audit committees while I looked at the effect of financial experts on the board. Therefore, even though Hassan argues that financial experts can reduce conflicts and agency problems between managers and shareholders, it is not completely applicable to my thesis. The accounting-based expertise can be useful for an audit committee who has an advisory function (Yorke & Appiagyei, 2023), but it does not necessarily apply to the management board in this paper who has a decision-making function. This difference in scopes of study can result in a difference in analysis outcomes.

Furthermore, a positive relationship is found between the percentage of female board members and the return on assets for companies in financial distress, which is in line with the results of Papangkorn et al. (2021). The authors find a positive relationship for firms in financial hardship and argue that gender diversity is needed in times of economic distress to monitor the firm's performance and give advice from a very different perspective. This positive effect of gender diversity was also evident in a study by Sun and Ye (2015), who believe in women's contribution of more distinct management experiences and stakeholder understandings. On the other hand, as discussed in the literature review, the papers surrounding the topic of the effect of female board members on the financial performance are divided. My positive results are not in line with Ahern and Dittmar (2012) who believed in the negative effects of females on the operating outcomes. This negative finding is explained by Ahern and Dittmar's focus on analyzing the effectiveness of a mandate in Norway for female representation as it results in recruiting younger and less experienced board members due to the pressure of a compulsory policy. Our study, on the contrary, investigates firms from many countries over a long period of time without pressure from a specific mandate. Considering other articles, Adams and

Ferreira (2008) share similar results but only in early stages where operating performance has been improved. The relationship was, however, found to disappear in the long run, but it does not necessarily mean that my results misalign with their papers since this thesis does not measure the effect in the long term. Older papers like Hillman and Harris (2002) show different outcomes since the paper was released a long time ago when women on average have less CEO experiences and business background than men. This is no longer the case as women have had more chances to gain these experiences by now in 2024.

Finally, only an insignificant relationship between the independence of directors and the return on assets is found for both distressed and non-distressed firms. These results are in line with Terjesen et al. (2016) and Garg (2007) who observe similar insignificant association. Garg suggests that the insignificant relationship comes from the limited pool of available candidates to become a board member, leading to a situation where board members might hold the CEO position at another company while still being called independent. This brings into question whether independent directors are truly independent to produce significant results. Terjesen et al. (2016) has a different explanation that significant relationships were only evident when the board was gender diverse, which might not be the case the companies in my dataset and possibly contributes to the insignificant findings found in my model. Other articles, such as the one by Dahya and McConnell (2007), use a difference-in-differences analysis to compare companies with independent directors against companies without independent directors ensuring all else equal, while my paper uses a fixed-effects regression to look at the individual time series for each company and how their performance develops over time. The former type of analysis often provides more reliable results, hence potentially explains the significant relationships. Moreover, this research is not in line with the stewardship theory, which points out that having a higher percentage of insider directors increases financial performance like papers by Donaldson (1990) and more recent ones by Volonte (2015), Sing et al., (2018), Farooq and Ahmad (2023). The results are also not consistent with the agency theory, which suggests a positive impact of outsider directors and supported by Dahya and McConnell (2007) and Rehman et al. (2021) that zooms on operating effectiveness and the independence of audit committee.

Market performance – Tobin's Q

Regarding Tobin's Q, gender equality shows a positive impact with similar reasons to the ROA model. This result aligns with the findings of Pandey et al. (2023) who proves the influential roles of women specifically on firms' market performance. However, there are still some differences in the findings compared to the ROA model which proves the impact of female board members only for companies in financial distress. Tobin's Q, on the other hand, only experiences the effects for companies without being under financial distress. It does not come as a surprise that there are differences between the two methods of measuring financial performance because Post & Byron (2015) once found an effect on the operating performance but not necessarily on the market performance.

Additionally, the percentage of financial experts has a positive effect on the market value of a firm if not in financial distress, but a negative effect if in financial distress which is similar to the effect on ROA. The first part of the findings is consistent with Li and Wang (2023), Liu and Sun (2022) while the second part in line with the research by Minton and Williamson (2014). The authors believe that before the distress time, directors often use their experiences in the industry to take excess risks that can later lead to a lower market value, explaining the negative effect. However, it also helps explain the positive effect associated with the percentage of financial experts when a firm is not in financial distress. In the case where firms do not face financial constraints, they often have stronger balance sheets and can handle more down-side risk. Thus, directors' risk-taking behaviors might be less impactful for these firms. Additionally, the negative effect during financial distress can be the consequences of financial experts' focus on project-specific performance rather than company-wide performance, despite that a company-wide perspective is very important when it comes to restructuring the company and its operations to improve its market health (Liu & Sun, 2022).

Lastly, the percentage of independent directors only has a significantly negative impact on Tobin's Q when a firm is in financial distress. This is inconsistent with the current literature, such as Hermalin and Weisbach (2003) who argued that executive boards during the financial distress time are more likely to recruit independent directors to search for an improvement in the financial position of the company. However, independent (external) directors who are hired by the boards often have good connections with large shareholders and therefore, make decisions based on the benefits of the shareholders (Khan et al., 2024). It means that external directors will act on behalf of the shareholders and be reluctant to invest in positive NPV projects because most or all the payoffs will be paid out to the bondholders when the companies have a relatively high level of debt due to financial distress. This phenomenon can hinder the further growth and financial health of the company and is called the debt overhang mechanism (Myers, 1977).

Differences between ROA and Tobin's Q

There are several differences between ROA and Tobin's Q. Percentage of female board members in non-distressed firms is significant for Tobin's Q, but not for ROA where the effect is only significant for firms in financial distress. The underlying reason could be that in a critical situation like financial distress, a lot of attention needs to be paid for improving the operating performance. Women, bringing different perspectives than men as discussed by Adams (2016), can contribute great values when difficult but necessary decisions must be made. Thus, it explains why female board members only have a positive effect on ROA for distressed firms. On the other hand, during the time when a firm is in a financially stable situation, the focus of shareholders and investors might switch towards (sustainable) growth other than operating efficiency and profitability like distressed firms. In this context, the addition of female board members is beneficial more towards boosting the company image while gaining investor confidence and stakeholders' approval for its corporate social responsibility practices, as suggested by Galbreath (2016).

Additionally, while both the ROA and Tobin's Q model show a negative effect of financial experts for distressed firms which are already explained in previous paragraphs, there is still a difference between these two models when it comes to these board characteristics. Unlike ROA, the Tobin's Q model observes an effect even for non-distressed firms, but positive. It can be that outside the difficult time, firms are already operating efficiently. Therefore, the role of financial experts is not noticeable enough to exert a significant impact on the operating

performance. However, the presence of financial experts on board does play an important role in enhancing the reliability of the firms due to their accounting-related background. Investors might be convinced to believe in the board's ability to perform reliable, high-quality reporting, hence, fully understand the financial health of the company to make wise decisions. As a result, the market performance of the firms is strengthened, especially when firms are financially stable.

Lastly, in the Tobin's Q model, independent directors have a significant impact for distressed firms, which is not the case for the ROA model due to insignificant results. To explain this difference, similar to financial experts, some board characteristics including board independence might be not effective in increasing the operating profits - ROA at all but do help increase the market performance of the firm - Tobin's Q because Tobin's Q focuses on market sentiment and how investors think of the company future, which can sometimes contradict the reality of current operating efficiency shown by ROA.

Robustness test

Regarding the robust test using O-score instead of Altman Z-score, the ROA model observes some inconsistencies. For example, compared to Z-score, O-score fails to show a significant relationship between female board members and ROA in neither distressed nor in non-distressed companies although this new result aligns with Carter et al. (2010) and Farrell and Hersch (2005). Justifying these differences, it can be that Z-score and O-score are computed differently. The inputs to calculate Z-score are all taken from the current year, while parts of O-score use lagged variables from the previous year. Thus, the O-score model has many missing observations for the first year when using values from the previous year as inputs. The decrease in the sample size might lead to different results compared to the Z-score model that has data from every year. Besides this reason, As explained in the *Data* section, the Z-score model might overestimate the probability of financial distress, leaving room for gender equality to show significant impacts for firms that are predicted by Z-score to be in financial distress. However, it might not be the case for O-score as the model is more realistic, hence more precisely identifying the financial distress, making the impact of females less significant.

On the other hand, the Tobin's Q model shows more consistency in the effects of corporate governance among the two models O-score and Z-score. For example, both models find that if a company is in financial distress, it has a higher Tobin's Q or in other words better market performance. These findings are inconsistent with negative findings of Wu et al. (2020) and might seem counterintuitive at first because the financial situations of the company should be worsened if firms are forced to restructure to avoid bankruptcy and a poor financial structure with excessive debt level is adopted. However, as the authors also emphasize on the importance of good corporate governance, Francis and Wu (2012) believe that different corporate boards can lead to different performance during a financial distress. It can be reasoned that if a company is successfully restructuring, its market perception can be improved, followed by an increasing market value relative to the total assets of the firm, supporting the positive effect found in this paper (Feldman, 2021).

Conclusion

This thesis successfully answered the (sub) research questions on how corporate governance, including gender equality, board independence and financial experts, impacts the financial performance of firms and how these effects differ in the context of financial distress. The result provides valuable insights on how firms can improve their financial performance and can escape from a situation of financial distress.

Three aspects of corporate governance are examined in this thesis, which are the percentage of female board members, the board independence and the percentage of financial experts on the board. The effect of these corporate governance variables is also measured in the context of financial distress. The probability of financial distress is calculated using both Altman Z-score and Ohlson O-score, which are then converted to a dummy variable. Using a model like the Z-score model can provide a more accurate picture of a diverse set of companies as I am not limited to the firms with a credit rating.

As becomes clear from the results section, corporate governance does influence the financial performance of both stable and financially distressed firms. However, not all corporate governance provisions are effective. A higher percentage of female board members increases the return on assets for firms in the United States, while a higher percentage of financial experts on the board decreases the return on assets. These effects were, however, only found for firms in financial distress. A relationship between the independence of board members and the return on assets was not found. These results provide valuable insights for firms who want to increase their return on assets. These firms should hire relatively fewer financial experts and more women on their board, especially in financial distress. Nevertheless, these results were not robust when using a different model of estimating financial distress - the O-score model. The O-score model and Z-score model do not reach a consensus for the effect on ROA. The only thing they agree on is the negative impact of financial experts, although each model observes this effect in a different financial situation.

Moreover, I find that companies in financial distress have a higher Tobin's Q than firms that are not in financial distress. The percentage of female directors also has a positive effect on Tobin's Q, but only for firms not in financial distress. Similarly, the percentage of financial experts has a positive effect for firms not in financial distress, but it also has a negative effect for firms in financial distress. The percentage of independent directors appears to have a negative effect on Tobin's Q for firms in financial distress as well. These findings indicate that firms in financial distress which want to increase their Tobin's Q should have fewer financial experts and outsiders on their boards. On the other hand, firms not in financial distress should have more women and more financial experts on their boards to have a higher relative market value. The results were robust when using the O-score model, which means any effects that are evident in the Z-score model also appear in the O-score model.

There are several limitations to my thesis that I am aware of, from which I will provide insights for further investigations in future studies. Firstly, despite a relatively large sample size, my thesis primarily focuses on firms in the United States and might not be able to be generalized to other countries. Future research can investigate this topic from a broader geographic scope. Secondly, firm performance may be influenced by many other variables that I was unable to incorporate into the regression model, which leads to a possible omitted variable bias and makes me unable to establish full causality.

A solution for this limitation is to include other firm characteristics that might be relevant for the financial performance, such as institutional ownership or the debt structure of companies like debt priority and seniority because most research assumes debt to be constant. A more diverse set of corporate governance provisions is also recommended, including any variables related to the power of shareholders within the firm. Another suggestion is to use other statistical models for analyzing the panel data, such as difference-in-difference analysis that compare identical firms and check the robustness of my results. This method might help testing for causality, obtain less noise and more reliable estimates. Besides this limitation, Z-score and O-score measures are not always fully correct because both are accounting-based models for estimating financial distress. Using a market-based model or machine-learning might help achieve a higher accuracy and reliability when identifying firms in financial distress. Besides that, although Z-score and O-score improve the sample size by including firms that are absent from the credit ratings model, these models are not able to effectively capture the information in the credit rating. As a result, further research is needed to find the best financial distress model to analyze both rated and non-rated firms in a more optimal way. A model with lagged independent variables can be implemented as a robustness check for my results as well, because firms' financial performance might be influenced by their historical decisions, such as leverage or R&D expenditure. This model might solve endogeneity and autocorrelation issues while accounting for the timing effects of the influences. Lastly, although this thesis already provides explanation for any differences observed in the results, further research can still deep dive into the underlying mechanism to explain those differences more profoundly.

Despite the limitations, the findings of my thesis have significant relevance for practitioners. By shaping a vast amount of knowledge surrounding the topic of corporate governance and financial distress, it might be possible to significantly reduce the number of firms that end up in bankruptcy. Shareholders can implement effective and accurate corporate governance provisions to enhance their financial performance and escape financial distress. Besides shareholders, policymakers can benefit from these insights to facilitate the enforcement of necessary mandates on boards, such as mandates for greater gender equality and higher board independence. Board members can be chosen based on education qualification and experience as additional criteria, especially when it comes to the appointment of new directors. Investors can also leverage the knowledge gained from this research to evaluate board characteristics and make more informed investment decisions.

Appendix

Table 1: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Tobin's Q	1.000										
(2) ROA	0.380	1.000									
(3) FD (O-score)	-0.106	-0.094	1.000								
(4) FD (Z-score)	-0.256	-0.338	-0.120	1.000							
(5) Size	-0.196	0.024	-0.061	0.216	1.000						
(6) Duality	-0.005	0.019	0.119	0.004	-0.002	1.000					
(7) Board size	-0.005	0.028	-0.007	0.000	0.026	-0.061	1.000				
(8) Covid	0.058	0.001	-0.136	0.027	0.153	-0.066	0.020	1.000			
(9) PercentFemale	0.023	0.025	-0.151	0.024	0.125	-0.043	0.198	0.474	1.000		
(10) PercentFE	0.092	0.009	-0.097	0.005	0.061	-0.031	-0.131	0.437	0.100	1.000	
(11) PercentID	-0.036	-0.040	-0.058	0.055	0.030	0.077	0.220	0.117	0.273	-0.285	1.000

Table 2: Regression model for ROA

	ROA (Z-score)	ROA (O-score)
FD Dummy	-0.00561	0.0183
	(-0.16)	(0.69)
PercentFemale	-0.000143	0.0149
	(-0.01)	(0.87)
PercentFE	-0.00885	-0.0168**
	(-1.58)	(-2.96)
PercentID	-0.0257	-0.0353
	(-1.29)	(-1.57)
FD#PercentFemale	0.0641*	-0.0283
	(1.98)	(-1.06)
FD#PercentFE	-0.0370**	-0.00882
	(-2.62)	(-0.70)
FD#PercentID	-0.0316	-0.0232
	(-0.79)	(-0.73)
Size	0.0239***	0.0234***
	(5.28)	(4.98)
Tangibility	0.103***	0.106***
	(5.79)	(5.91)
Leverage	-0.189***	-0.229***
	(-13.91)	(-17.32)
Duality	-0.00253	0.00200
	(-0.14)	(0.11)
Board Size	0.000804	0.000954
	(0.95)	(1.13)
Covid	-0.00154	-0.000580
	(-0.45)	(-0.17)
Constant	-0.154**	-0.141**
	(-3.28)	(-2.80)
N	6714	6714
R^2	0.169	0.151

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Regression model for Tobin's Q

	Tobin's Q (Z-score)	Tobin's Q (O-score)
FD Dummy	0.609	0.798
	(1.90)	(1.66)
PercentFemale	0.773*	0.768*
	(2.17)	(2.09)
PercentFE	0.682***	0.611***
	(7.05)	(6.67)
PercentID	0.593	0.477
	(1.56)	(1.15)
FD#PercentFemale	0.196	-0.238
	(0.51)	(-0.56)
FD#PercentFE	-0.512***	-0.453*
	(-3.52)	(-2.57)
FD#PercentID	-0.717	-1.004
	(-1.94)	(-1.79)
Size	-0.0187	-0.0484
	(-0.22)	(-0.53)
Tangibility	1.257***	1.274***
	(3.46)	(3.56)
Leverage	-2.394***	-2.613***
	(-12.74)	(-13.06)
Duality	-0.684	-0.440
	(-1.87)	(-1.20)
Board Size	-0.0142	-0.0120
	(-0.84)	(-0.71)
Covid	0.0637	0.0823
	(1.05)	(1.31)
Constant	-0.154**	-0.141**
	(-3.28)	(-2.80)
N	6714	6714
R^2	0.169	0.151

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Hausman Test

```
.
. //Hausman test, result is that fixed effects is applicable
. hausman fixed random

                   ---- Coefficients ----
              |       (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              |      fixed        random        Difference         S.E.
--------------+----------------------------------------------------------------
      ln_size |    .0257202      .0114542         .014266          .00261
   tangibility |    .1998995      .0934806        .1064189        .0105165
     leverage |   -.1709008      -.213732        .0428312        .0084286
   rd_expense |   -.9537886     -.8826088       -.0711798         .011663
       duality |   -.0063907     -.0020935       -.0042971        .0087364
           BS |    .0002131      .0002573       -.0000443        .0006363
        covid |   -.0057755     -.0009395        -.004836        .0016265
  percentfem~e |   -.0099063      .0083224       -.0182287        .0072265
 1.financia~s |   -.0561008     -.0489416       -.0071592        .0100348
financial_~s#|
          c. |
  percentfem~e |
            1 |    .1296134      .1114367        .0181767        .0118683
   FEfpercent |   -.0038347     -.0004476       -.0033871         .002122
financial_~s#|
 c.FEfpercent |
            1 |   -.0084164     -.0037962       -.0046202        .0023256
    percentID |   -.0203262     -.0259162          .00559        .0112257
financial_~s#|
  c.percentID |
            1 |   -.0135661     -.0146544        .0010883        .0122703
--------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
             B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

           chi2(14) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =       182.01
           Prob>chi2 =      0.0000
```

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