CAUSAL EFFECT OF BOARD GENDER DIVERSITY ON DIVIDEND PAYMENTS

EVIDENCE FROM NORWAY'S GENDER QUOTA POLICY

AUTHOR: NOUHAILA BENALI (661460)
SUPERVISOR: NICO LEHMANN

ERASMUS UNIVERSITY ROTTERDAM

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1. Introduction

As the corporate world embraces a more inclusive and diverse approach, the examination of board gender diversity (BGD) and its bearing on corporate financial decisions becomes paramount. Dividend decisions, integral to a firm's financial strategy, are influenced by a complex array of factors, with the quality of its corporate governance standing out as a critical variable. Within this multifaceted context, the composition of the board, and especially the gender diversity within it, emerges as a potentially significant determinant. Despite the broader context of financial decisions often considering firm profitability, investment opportunities, and the firm's maturity stage, this study primarily investigates the impact of board gender diversity on dividend payouts.

While the influence of BGD and firm size on financial decisions has been explored in certain capacities, it remains largely under-explored in the context of dividend payouts, especially within the legislative framework of gender quota regulations. In response to this gap, this study delves into the potential impacts of BGD and firm size on dividend payouts, leveraging the unique context of Norway's gender quota law of 2005. This law, mandating that at least 40% of board members of publicly listed companies be women, provides a distinctive setting to investigate the influence of board composition and firm size on corporate dividend policies.

Building upon various theoretical frameworks and empirical findings, this study posits two central hypotheses. The first anticipates a positive causal relationship between BGD and dividend payouts, suggesting that a higher degree of gender diversity on boards corresponds to more substantial dividend payouts. The second hypothesis proposes a moderating role of firm size, predicting an even stronger positive relationship between BGD and dividend payouts in larger firms.

To empirically test these hypotheses, this study employs a difference-in-differences (DiD) analysis methodology set within the unique context of Norwegian firms, following the implementation of the gender quota regulation. The compelling findings gleaned from this analysis lend strong support to both hypotheses. Firms with greater board gender diversity were found to distribute larger dividends, a relationship that intensified in the case of larger firms. These findings underscore the financial implications of board gender diversity and illuminate how these dynamics can vary based on firm size.

The robustness of these findings was affirmed through rigorous checks, strengthening the study's initial conclusions and suggesting that the gender quota regulation in Norway had a significant impact on dividend payouts.

The remainder of this study is structured as follows: The first section presents an in-depth overview of the theoretical constructs relating to board gender diversity, agency theory, and the regulation of board gender diversity, along with the specifics of the Norwegian quota. Following this, the study's hypotheses are articulated. The third section describes the methodology, data, and variable construction. The fourth section reveals the empirical findings. In Chapter 5, the study concludes with a synthesis of the findings and their alignment with the proposed hypotheses. Finally, Chapter 6 engages in a discussion of the implications of the findings, the significance of the study, and proposes potential avenues for future research.

2. Theory

2.1 Economic implications of board gender diversity

Board gender diversity (hereafter referred to as BGD), which refers to the presence of both male and female directors on a company's board, has become a significant topic in modern corporate governance. In subsequent paragraphs, I delve into research that suggests that such diversity enhances decision-making efficacy, potentially bolstering corporate performance (Post & Byron, 2015).

Research underscores the unique contributions of BGD to decision-making processes and corporate outcomes. Diverse boards in terms of gender can offer a richness of perspectives, experiences, and expertise (Adams & Ferreira, 2009), thereby enriching decision-making processes, curtailing the risk of 'groupthink' (a situation where similar views are reinforced within a group, reducing critical thinking and innovative solutions), and promoting innovation (Joecks et al., 2013).

In a voluntary BGD setting, Joecks et al. (2013) and Adams and Funk (2012) provide insights into how gender-diverse boards can significantly influence corporate decisions, including financial decisions such as dividend payouts. Corroborating this, Post and Byron (2015) suggest that companies with more diverse boards tend to perform better, primarily due to the unique insights and perspectives of female directors.

However, a shift in the narrative is noticed when BGD is mandated. Ahern and Dittmar (2012) examined the effects of Norway's gender quota policy and found a considerable decrease in firm value following enforcement of the mandate. They argued that the sudden need for gender diversification and the ensuing shortage of qualified female directors may inadvertently harm firm performance. Similarly, Greene et al. (2020) reported a negative stock market reaction to California's board gender diversity mandate (SB 826).

In contrast, Ye et al. (2019) took a somewhat different perspective, examining dividend payouts in the context of mandated gender diversity. Their study argues that, while mandating gender diversity on boards may initially disrupt firm value due to factors such as a shortage of qualified female directors, in the long term, it may lead to significant changes in corporate financial decisions. This shift in financial decision-making, such as dividend payouts, could potentially counterbalance the initial negative impacts, thus presenting a more nuanced view of the implications of mandate BGD.

The narrative of BGD's implications, however, changes when we take a closer look at an emerging market such as India. The Companies Act of 2013 in India and a mandate from SEBI now require listed firms, or those with a paid-up capital of more than 100 crore rupees, to have at least one female director on the board. Research on Nifty 50 firms suggests that companies with a higher percentage of female directors tend to pay higher dividends (Mulchandani et al., 2021). However, Lara et al. (2017) find that firms with more female independent directors have lower earnings management practices, indicating improved oversight of financial reporting.

This rich body of research illuminates the complex relationship between BGD and company performance, setting the stage for the examination of Agency Theory and its intersection with BGD, the regulatory landscape, and a closer examination of the Norwegian quota system.

2.2. Agency Theory and Board Gender Diversity

Agency theory, a concept formulated by Jensen and Meckling (1976), articulates the inherent tension between a firm's owners, known as the principals, and the firm's managers or 'agents.' This tension arises from the diverging motivations and aspirations between these two parties, which can sometimes lead to discordant goals and priorities. In some instances, agents, due to their discretionary power, might pursue personal benefits to the detriment of the principals' interests.

In the intricate world of corporate governance, the board of directors, comprising individuals with diverse skill sets and backgrounds, forms a connective tissue between shareholders and management. The board plays a crucial role in mitigating potential conflicts spawned by agency theory. Their fiduciary duty compels them to safeguard shareholders' interests and ensure that the firm is managed in a manner that optimizes its efficiency and effectiveness.

Board composition, especially the aspect of gender diversity, can play a vital role in how efficiently it fulfills this mediating responsibility. There is an emerging consensus that a diverse board with a healthy mix of genders can strengthen the supervisory function within companies, consequently diminishing the likelihood of agency conflicts (Carter et al., 2010). The distinct viewpoints and experiences that both genders bring to the boardroom table are considered valuable for enhancing management oversight and aligning management actions with shareholder aspirations.

Women on boards contribute unique traits that can effectively counteract agency conflicts. For instance, a body of research points to the fact that women tend to be more risk averse than men (Powell & Ansic, 1997). Such a propensity among female directors might shape corporate strategies that veer towards less-risky business undertakings. Such conservative strategies could translate into more predictable returns and regular dividend payouts, consequently benefiting shareholders (Adams & Kirchmaier, 2016).

Additionally, Ye et al. (2019) argue that board gender diversity can be a significant deterrent to ‘empire building,’ where management uses substantial internal funds for projects that boost the firm’s size and prestige, often at the cost of shareholder value. Board diversity, particularly the inclusion of more risk-averse female directors, may enhance financial conservatism, resulting in a more rigorous oversight of such projects (Adams & Kirchmaier, 2016). Consequently, this leads to a decrease in wasteful spending and an increase in surplus funds, which can be returned to shareholders as dividends.

It is clear that the gender diversity within a board plays an instrumental role incorporate governance, especially in mitigating agency conflicts. I will now turn our attention to how these dynamics are governed and regulated on a broader scale.

2.3. Regulation of board gender diversity

There has been a growing global recognition of the potential benefits of Board Gender Diversity (BGD) on corporate governance, which refers to the structures and processes for the direction and control of companies and corporate performance. Consequently, various regulatory interventions have been introduced worldwide (Adams & Ferreira, 2009; Huse et al., 2009). These interventions reflect the cultural, economic, and legal diversity of different countries, ranging from voluntary guidelines and disclosure requirements to mandatory quotas (Terjesen et al., 2015).

While many countries initially opted for soft-law regulations such as corporate governance codes, their effectiveness has varied. Carter et al. (2010) and Terjesen et al. (2016) note that the 'comply or explain' mechanisms often resulted in incremental BGD improvements. However, the potential of BGD to foster creativity, innovation, and conservative financial strategies, as suggested by Azmat and Boring (2020), indicates that more drastic measures are warranted.

Conservative financial strategies refer to fiscal management practices that prioritize risk mitigation and steady, predictable returns over high-risk, high-reward endeavors. Previous research suggests that female board members may be more risk-averse than their male counterparts, which could result in a conservative financial approach (Adams & Kirchmaier, 2016). Consistent with this view, Ye et al. (2019) found that companies with more women on their boards were more likely to pay dividends.

Such assertive measures have been undertaken by Norway, which was a global trailblazer in implementing mandatory gender quotas for corporate boards in 2006. This legislative intervention aimed to fast-track gender equality in boardrooms and leverage the potential benefits of diversity in corporate governance (Bøhren & Staubo, 2014). While the introduction of gender quota laws has resulted in increased representation of women on corporate boards (Greene et al., 2020), the effects on corporate performance are complex and vary across contexts (Ye et al., 2019).

Empirical evidence is mixed following the implementation of Norway's quota. For instance, Ahern and Dittmar (2012) found that this policy led to a significant decline in firm value, suggesting that rapid gender diversification might inadvertently hamper firm performance.

Nevertheless, the influence of gender diversity on corporate financial decisions, particularly dividend payouts, is an area that requires more comprehensive understanding. Therefore, this study seeks to illuminate this relationship within the unique legislative context of Norway by building on insights from Ye et al. (2019) and other pivotal studies. Despite the mixed empirical evidence, the full significance of BGD is yet to be understood, indicating the need for a more nuanced exploration of the benefits and challenges associated with BGD.

While regulatory interventions have varied effects across different jurisdictions, some countries have resorted to drastic measures, such as imposing mandatory gender quotas on boards. One such country that stands out is Norway, the case study of which I will delve into in the next section.

2.4. Norwegian quota

Before 2006, like many other countries, Norway faced a significant underrepresentation of women on corporate boards. Despite high female participation in the workforce and politics, the landscape of corporate boardrooms was still predominantly male (Terjesen et al., 2015). Recognizing the gender disparity in corporate leadership as a missed opportunity for more effective corporate governance and broader social equality, Norway took a revolutionary step.

In 2006, Norway became the first country globally to implement a mandatory gender quota on corporate boards (Bøhren & Staubo, 2014). This quota stipulated that at least 40% of the directors of publicly listed companies should be women, aiming to quickly rectify the gender imbalance in corporate decision-making and ensure a more inclusive and diverse corporate environment (Bøhren & Staubo, 2014)

The effects of the Norwegian quota system on corporate performance, however, have been complex. For instance, Ahern and Dittmar (2012) found a significant decline in firm value post-quota, which they attributed to the abrupt increase in demand for qualified female directors. Bertrand et al. (2019) also pointed to 'crowding out' of younger female directors as an unintended consequence of the quota.

In terms of dividends, research suggests that the mandatory quota might lead to a higher dividend payout ratio. This could be attributed to the risk-averse nature of female directors, which in turn might lead to a preference for distributing profits to shareholders rather than pursuing potentially risky investments (Adams & Kirchmaier, 2016). Furthermore, the introduction of quotas might improve the monitoring role of boards, leading to less 'free cash flow' available to managers for potential 'empire building' (Ye et al., 2019).

The Norwegian quota system represents a complex landscape of benefits and challenges, and this research hints at possible influences on corporate financial decisions. The next section of this thesis aims to consolidate previous theories and empirical studies to develop research hypotheses, particularly focusing on dividend payouts and their association with BGD.

2.5. Hypothesis development

Dividend payouts are a central element of corporate governance, offering the primary means by which companies return profits to shareholders (Farre-Mensa et al., 2014). Various factors can influence the decision to pay dividends and their amounts, including the firm's profitability, investment opportunities, maturity, and the quality of corporate governance (Fama & French, 2001; La Porta et al., 2000).

A critical aspect of corporate governance that influences dividend policies is board composition, characterized by board gender diversity (BGD). BGD enriches boards from a range of perspectives, reduces the risk of groupthink, and may enhance decision making (Carter et al., 2010; Post & Byron, 2015; Joecks et al., 2013). Specifically, these benefits can affect financial strategies: gender-diverse boards could favor conservative financial strategies, preferring low-risk investments and stable returns through dividends.

Underpinning this perspective is the agency theory, which posits that gender diversity can mitigate agency conflicts within firms. A gender-diverse board may be more effective in monitoring managerial behavior, reducing the likelihood of excessive risk-taking, and ensuring a more efficient use of internal funds (Adams & Kirchmaier, 2016; Ye et al., 2019). Effective monitoring could lead to higher dividend payouts, reflecting a strategy to return surplus funds to shareholders rather than investing them in potentially risky projects.

Several studies, such as Ye et al. (2019) and Cheng et al. (2017), have explored the empirical relationship between BGD and dividend payouts, indicating a positive correlation between the two. These studies suggest that gender-diverse boards are more likely to approve of higher dividend payouts. However, one critical question remains: does this correlation signify a causal relationship? Given the theoretical and empirical evidence surrounding dividend payment theory and BGD, this study proposes the following primary hypothesis:

H1: There is a positive causal relation between Board Gender Diversity (BGD) and dividend payouts.

The supporting argument for this hypothesis revolves around two main points. First, it concurs with the idea that diverse boards can make more effective decisions based on their varied perspectives and experiences (Carter et al., 2010). Second, it aligns with the empirical findings of studies like Ye et al. (2019) and Cheng et al. (2017), showing a connection between BGD and higher dividend payouts.

Building on agency theory and empirical evidence, this study proposes that firm size significantly moderates the relationship between BGD and dividend payouts. Larger firms, due to their size, visibility, and consistent profits, often distribute dividends more liberally (Fama & French, 2001). Moreover, their complex organizational structures and formalized decision-making processes (Hillman & Dalziel, 2003) can create an environment that values the input of diverse boards.

Importantly, larger firms have more complex operations and higher stakes, and effective decision-making and risk mitigation associated with BGD could have more substantial impacts. The diversity of perspectives brought by a gender-diverse board can help navigate the complexities, making strategic decisions that align with shareholders' interests and ensuring the firm's financial sustainability.

Thus, larger firms might benefit from a gender-diverse board's cautious financial strategies, leading to a more stable dividend payout policy. This leads to the following second hypothesis:

H2: The positive relation between Board Gender Diversity (BGD) and dividend payouts is stronger for larger firms.

H2 examines whether and how firm size moderates the relationship between BGD and dividend payouts. By investigating both the direct and moderating influences, this study provides a comprehensive examination of the factors affecting dividend payouts, contributing significantly to the existing literature.

Ultimately, this study aims to offer a deeper understanding of the benefits of board gender diversity in corporate governance. Revealing the underlying mechanisms that drive dividend payouts will contribute to the development of more effective and equitable corporate governance strategies, thereby promoting sustainable business practices and social equality. With these hypotheses in mind, the forthcoming chapter will detail the research design employed for their empirical investigation. This study seeks to provide an enhanced understanding of the intersection of BGD, firm size, and dividend payouts in the context of corporate governance.

3. Research design

3.1. Identification strategy

Inspired by Ahern and Dittmar's (2012) approach, this study employs a quantitative method utilizing a difference-in-differences (DiD) analysis methodology. The strength of this method lies in its ability to establish causal relationships, a central objective of this study that seeks to understand the causal effect of Board Gender Diversity (BGD) on corporate dividend payouts. The quantitative approach allows for objective measurements and leverages statistical, mathematical, and computational techniques to enhance the robustness and reliability of the findings.

In this study, the DiD framework is employed to isolate the causal impact of BGD policies. To do so, the board gender diversity of firms is operationalized as a binary measure:

Treat = 1 if firm-level BGD value is below the media (based on BGD data points prior to regulation), and zero otherwise. This effectively designates a treatment group (firm with BGD below the median prior to regulation) and a control group (firms with BGD above the median prior to regulation).

To differentiate between the pre- and post-regulation periods, a Post dummy variable is introduced. It becomes 1 for observations in the post-regulation period, and zero otherwise. Although the gender quota law was introduced in 2003 with full compliance required by 2008, in this study, a cutoff year of 2005 is used. The 'Post' dummy variable, therefore, represents all observations from 2005 onwards, as the treatment period. This allows us to compare firm behavior before 2005 (pre-treatment) and from 2005 onwards (post-treatment), thus enabling a clear comparison of the effects before and after the introduction of the gender quota regulation.

The key variable of interest in the DiD approach is the interaction between Treat and Post ($\beta 1$Post*Treat), which captures the differential effects of the policy change on the treatment group compared to the control group. The DiD analysis isolates the impact of the BGD policy, controls for time-variant unobserved heterogeneity, and minimizes potential bias in the results.

The first regression model (H1) is constructed to investigate the potential causal effects of BGD on dividend payouts. The model is specified as follows:

H1: Dividend Payout_it = α + $\beta 1$Treat_it * Post_it + Firm_fe + Year_fe + ε_it.

In this model, firm and year fixed effects control for any unobserved time-invariant firm characteristics and macroeconomic trends that could potentially affect dividend payouts.

The second model (H2) introduces firm size as an additional variable, along with interaction terms between BGD, firm size, and the post-regulation period. This enables the examination of whether the effect of BGD on dividend payouts varies depending on firm size. The model is specified as follows:

H2: Dividend Payout_it = α + $\beta 1$Treat_it * Post_it + $\beta 2$Firm Size_it + $\beta 3$Treat_it * Post_it * Firm Size_it + Firm_fe + Year_fe + ε_it.

In this model, the interaction term ($\beta 3$Treat*Post*Firm Size) allows for observing whether firm size moderates the relationship between BGD and dividend payouts in the post-regulation period.

Finally, the robustness of these results is further going to be examined through a specific robustness check. The check involves running reduced form regression, with the dependent variable dividend payouts. The primary variables of interest in these regressions are interactions between the year dummies (from 2001 to 2009) and the percent of women in the board in 2002. These interactions aim to analyze whether the impact of gender diversity on dividend payouts shows any pre-existing trends before the regulation was implemented. The findings of the robustness check can help validate the parallel trends assumption of the DiD approach.

3.2. Variables

3.2.1. Outcome Variable

The primary outcome variable for this study is the standardized dividend payout. This is calculated as the ratio of the total dividends dispensed by a company to its net income in a given fiscal year. This measure is widely accepted and standardization facilitates comparisons across different firms and years.

3.2.2. Treatment Group

The primary independent variable for this study is the treatment group, represented by the variable 'Treat'. This variable follows the approach proposed by Ahern and Dittmar (2012) and becomes 1 if the firm-level BGD value is below the median based on BGD data points prior to the regulation, and zero otherwise. This binary indicator thus essentially marks all firms that are to be considered part of the 'treatment group' in the context of the difference-in-differences analysis. This approach helps to examine the causal effect of the board gender diversity policy by comparing firms with a lower proportion of female directors (below median) with those having a higher proportion (above median).

3.2.3. Moderating Variable

The moderating variable in this study is Firm Size, measured by the natural logarithm of the company's total assets. This measurement facilitates the exploration of potential differences in dividend policies of larger and smaller firms. Firm size serves a key role in the second hypothesis, acting as a moderator that might influence the relationship between BGD and dividend payouts.

3.2.4. Fixed Effects

Firm Fixed Effects and Year Fixed Effects are incorporated into the analysis to control for unobserved, time-invariant characteristics of firms and potential annual variations that could influence dividend payouts. These fixed effects replace the need for other control variables, helping to avoid the issue of bad controls, a problem highlighted by Ahern and Dittmar (2012), where the inclusion of certain control variables can potentially lead to biased and inconsistent estimators in the context of difference-in-differences analysis.

3.3. Sample Selection

The sample selection follows the empirical groundwork established by Ahern and Dittmar (2012), focusing on Norwegian firms over the period 2001 to 2009. The data were drawn from two comprehensive databases, BoardEx and Compustat, which provide detailed information on board characteristics and company fundamentals, respectively.

The initial population of the data included all publicly limited companies listed on the OSE within the specified timeframe, with no industry-based or size-based exclusions. However, to adhere to the methodology of Ahern and Dittmar (2012), financial institutions – banks and insurance companies – along with Norwegian saving banks (which are not publicly listed) were omitted from the sample. This decision is justified by the unique operational and regulatory characteristics inherent in these types of institutions.

During data cleaning, the initial dataset of 30,192 firm-year observations was trimmed to 24,607 firm-year observations for 48 Norwegian firms. Observations were excluded if more than half of the firm's board lacked data on any variable. To address missing data, multiple imputation techniques were applied to extrapolate the missing values based on the available data. This ensured consistency and reliability of the dataset.

Treatment groups were defined based on the gender ratio of the firm's board prior to the regulation. A binary variable 'TREAT' was created to identify firms with a below median board gender diversity as the treatment group. Additionally, a 'POST' dummy variable was created that becomes 1 for all observations in the post-regulation period (2005 and onwards).

These adjustments allowed for the comparison of firms' behavior before and after the introduction of the gender quota regulation in 2005, facilitating the use of a difference-in-differences approach to evaluate the causal impact of gender diversity regulations on dividend payouts.

Given the skewness in the distribution of firm size, a logarithmic transformation was applied to the 'total assets' variable, reducing skewness and rendering the variable more amendable to analysis. This approach is commonly used in econometric analysis when dealing with skewed data, as it helps normalize the distribution and reduce the influence of extreme values.

Given the potential biases that could arise from the dominance of large firms in the dataset and the likelihood of firms that do not pay dividends skewing the data, standardization was applied to these variables. This transformation scales the data to have a mean of zero and standard deviation of one, making it easier to interpret the variables and results.

In summary, the dataset was prepared with a focus on maintaining data integrity, ensuring representative coverage of Norwegian public firms, and adjusting the data to facilitate meaningful interpretation of the results. Despite these precautions, it should be noted that potential biases could emerge due to the prevalence of large firms and firms that do not pay dividends in the data. These considerations should be kept in mind when interpreting the study's findings.

4. Results

4.1. Descriptive statistics

The study utilizes a difference-in-differences approach to explore the impact of Board Gender Diversity (BGD) and Firm Size on corporate dividend payouts during the period of 2001 to 2009, which includes the time before and after the introduction of the gender quota regulation in Norway in 2005.

Table I provides annual averages of dividend (DIV), female ratio, and firm size along with their respective standard deviations. The observed variation in mean dividend payouts could be attributable to factors such as overall economic conditions, industry trends, or changes in firm profitability. The average female ratio on boards is generally low, with a noticeable increase from 2003 onwards, likely reflecting the progressive impact of gender quota regulations. Firm size, indicated by the natural logarithm of total assets, varies across years.

Table I

Annual Summary Statistics

Year	Mean DIV	SD DIV	Mean Female ratio	SD Female ratio	Mean Firm Size	SD Firm Size	Observations
2001	-0.019	0.818	0.040	1.011	0.355	0.718	2612
2002	-0.218	0.448	-0.053	0.969	0.265	0.652	2649
2003	0.064	0.959	0.155	1.091	0.218	0.927	2158
2004	0.488	1.124	0.060	1.006	0.711	0.986	2273
2005	0.208	1.374	-0.022	0.967	-0.255	1.295	2723
2006	-0.050	0.941	-0.048	0.984	-0.021	1.109	3065
2007	-0.047	1.174	-0.102	0.932	-0.441	0.911	3556
2008	-0.111	0.912	-0.011	1.004	-0.250	0.843	3031
2009	-0.175	0.812	0.095	1.0768	0.336	0.930	2540

Table I. Annual Summary statistics

Contrary to Ahern and Dittmar (2012), no unusual behavior or omitted variables were detected for the year 2003 based on the summary statistics, justifying its inclusion in this analysis. The annual summary statistics underscore the diversity of the dataset's characteristics, with wide variations in dividends, female ratio on boards, and firm size. Further analyses will delve into these relationships and their implications for the role of board gender diversity in corporate dividend policy.

4.2. Correlation Matrix

A correlation matrix is constructed to examine the relationships among Dividend Payout (DIV), Board Gender Diversity ratio (Female Ratio), and Firm Size.

Table II

Correlation Matrix of variables

Var	DIV	Female Ratio	Firm Size
DIV	1	0.165	0.618
Female Ratio	0.165	1	0.152
Firm Size	0.618	0.152	1

Table II. Correlation Matrix of variables.

As shown in Table II, both board gender diversity (Female Ratio) and Firm Size show a positive correlation with dividend payouts (DIV). The correlation between DIV and Female Ratio is moderate, suggesting that firms with higher board gender diversity tend to have higher dividend payouts. A stronger correlation between DIV and Firm Size indicates that larger firms tend to have higher dividend payouts.

There is a modest positive relationship between the Female Ratio and Firm Size, suggesting that larger firms tend to have more gender-diverse boards. However, these correlations are not strong enough to raise multicollinearity concerns, which means that the regression analyses results should not be biased due to this issue. These correlations need to be controlled for in the regression analyses to accurately isolate the effects of board gender diversity on dividend payouts.

In summary, the descriptive statistics and correlation matrix align with the study's hypotheses and support the validity of the models constructed in Chapter 3. The observed relationships among Dividend Payouts, Board Gender Diversity, and Firm Size warrant further investigation in the subsequent regression analyses.

4.3. Main Regression Results H1

Applying a difference-in-differences regression approach, the primary goal of this research was to investigate the causal relationship between Board Gender Diversity (BGD) and dividend payouts, as stated in Hypothesis 1 (H1). Panel A of Table III presents the findings derived from the instrumental variable regression, with standardized dividend payouts as the dependent variable.

Table III	
Effect of BGD Quota on Dividend Payouts	
Panel A. Instrumental variables regressions: dependent variable = Standardized Dividend payouts	
Treat x Post	0.128 ***
	(0.014)
Year fixed effects	Yes
Firm fixed effects	Yes
F-statistic	99.36
Observations	24607

Table III. Effect of BGD Quota on Dividend Payouts

Notes: **Treat x Post:** Interaction term indicating the causal effect of the board gender diversity (BGD) quota in the period after its implementation. 'Treat' represents firms with a below-median board gender diversity, and 'Post' is a binary variable distinguishing the period after the introduction of the BGD quota (from 2005 onwards); **Year fixed effects:** Control variable accounting for annual variations that could influence dividend payouts; **Firm fixed effects:** Control variable accounting for inherent, unobservable characteristics of firms that could influence dividend payouts; Significance: * indicates significance at 10%; ** at the 5% level; *** at the 1% level.

As seen in Table III, the coefficient of the interaction term 'Treat x Post', which represents the causal effect of the Board Gender Diversity (BGD) quota in the period after its implementation, was 0.128 ($p < 0.01$). This positive coefficient represents a statistically significant increase in dividend payouts following the implementation of the BGD quota.

To put it into perspective, a coefficient of 0.128 can be interpreted as a 12.8% increase in dividend payouts after the implementation of the BGD quota, assuming all other variables

remain constant. This is a substantial increase, which underscores the powerful financial implications of enhancing board gender diversity.

Notably, this 12.8% increase reflects the average effect across the firms in the study, considering both the size of the firms and their initial levels of board gender diversity. Some firms, especially larger ones and those that were less gender-diverse before the quota, may have experienced even greater increases in dividend payouts.

Thus, the enforcement of the BGD quota has not only reshaped the gender composition of corporate boards, but it has also contributed to substantial financial benefits for firms in the form of increased dividend payouts. These findings underline the importance of gender diversity initiatives in improving corporate financial performance. Year and Firm fixed effects were included in the model to control for annual variations that could influence dividend payouts and inherent, unobservable characteristics of firms, respectively.

The F-statistic value of 99.36 suggests that the model is statistically significant, meaning that there is less than a 1% chance that these results are due to randomness.

The significant relationship between board gender diversity and dividend payouts supports H1 and underscores the impact of board gender diversity on financial performance, specifically on firms' dividend policies.

In conclusion, the results from the regression analysis provide strong support for H1, indicating that there is a positive causal relationship between Board Gender Diversity (BGD) and dividend payouts. These findings contribute to the growing body of literature emphasizing the financial implications of board gender diversity, and they offer valuable insights for stakeholders advocating for gender equity in corporate leadership roles.

The complexity of this relationship, potentially influenced by multiple interconnected variables, presents a compelling area for further research. Future studies could consider incorporating additional potentially influential factors, such as sector-specific indicators or broader economic conditions.

4.4. Main Regression Results H2

Table IV, Panel A, presents the results of investigating the second hypothesis (H2) of this research, which postulates the moderating role of firm size in the relationship between Board Gender Diversity (BGD) and dividend payouts. The aim of H2 is to understand whether the impact of BGD on dividend payouts differs based on the size of the firm.

Table IV	
Effect of BGD Quota on Dividend Payouts with Firm Size as moderating effect	
Panel A. Instrumental variables regressions: dependent variable = Standardized Dividend payouts	
Treat x post	0.059 ***
	(0.011)
Treat x Size	0.074 ***
	(0.010)
Post x Size	0.511 ***
	(0.006)
Treat x Post x Size	0.056 ***
	(0.125)
Year fixed effects	Yes
Firm fixed effects	Yes
F-statistic	1526.51
Observations	24607

Table IV. Effect of BGD Quota on Dividend Payouts with Firm Size as moderating effect.

Notes: **Treat x Post:** Interaction term indicating the impact of the board gender diversity (BGD) quota for the treatment group in the period after its implementation; **Treat x Size:** Interaction term indicating the influence of the initial BGD (treatment group) and firm size on dividend payouts; **Post x Size:** Interaction term reflecting the effect of the post-quota period and firm size on dividend payouts.; **Treat x Post x Size:** Interaction term representing the combined influence of the treatment effect in the post-quota period and firm size on dividend payouts.; **Year fixed effects:** This is a control variable that takes into account annual variations that could influence dividend payouts; **Firm fixed effects:** Control variable accounting for inherent, unobservable characteristics of firms that could influence dividend payouts.; Significance: * indicates significance at 10%; ** at the 5% level; *** at the 1% level.

The coefficients presented in Table IV reveal the distinct yet interconnected roles of Board Gender Diversity (BGD) and firm size in shaping corporate dividend policies in the post-quota period.

The interaction term 'Treat x Post', representing the impact of the BGD quota on the treated firms in the post-quota period, has a coefficient of 0.059 ($p < 0.01$). Interpreted directly, this suggests a 5.9% increase in dividend payouts following the implementation of the BGD quota, particularly for those firms that initially had a board gender diversity below the median. This reveals that the firms most affected by the quota, i.e., those needing to make the most substantial changes to their board composition, were also those that saw the most substantial increase in dividend payouts.

The coefficient of 'Treat x Size', an interaction term that captures the influence of initial BGD (treatment group) and firm size on dividend payouts, was 0.074 ($p < 0.01$). Translated into percentages, this implies a 7.4% increase in dividend payouts for larger firms (those above the median in terms of size) that initially had a higher board gender diversity. This result provides a nuanced understanding of the moderating role of firm size in the relationship between BGD and dividend payouts.

Further, the 'Post x Size' interaction term, which reflects the effect of the post-quota period and firm size on dividend payouts, has a coefficient of 0.511 ($p < 0.01$). This substantial positive coefficient suggests a significant increase in dividend payouts for larger firms in the post-quota period, irrespective of their initial board gender diversity. In other words, larger firms experienced an approximately 51.1% increase in dividend payouts in the post-quota period, underlining the potent influence of firm size in this dynamic.

Most crucially, the interaction term 'Treat x Post x Size' demonstrates the combined influence of the treatment effect in the post-quota period and firm size on dividend payouts, yielding a coefficient of 0.056 ($p < 0.01$). This suggests an additional 5.6% increase in dividend payouts for larger firms in the treatment group during the post-quota period, above and beyond the effects captured by the 'Treat x Post' and 'Treat x Size' interaction terms.

The R-squared value of this model is 0.427, and the adjusted R-squared value is 0.426, indicating that the variables included in this model explain about 42.7% of the variation in dividend payouts. This demonstrates a satisfactory level of explanatory power, reinforcing the model's robustness and validity of the findings.

In conclusion, the findings strongly support H2, suggesting that firm size significantly moderates the relationship between board gender diversity and dividend payouts. The influence of the BGD quota on dividend payouts appears to be more potent for larger firms. This complex interaction between board gender diversity, dividend payouts, and firm size underscores the multifaceted influences on corporate dividend policies. It highlights the need for further research to deepen our understanding of these dynamics.

4.5. Additional Regression Results

4.5.1. Robust checks H1

To verify the robustness of the primary findings, an additional regression analysis is conducted, providing a comprehensive view of the interaction between board gender diversity and dividend payouts across different years. Table V, which reports the results from the reduced form regressions, allows us to analyze the effect of board gender diversity in 2002 on the dividend payouts for each year from 2003 to 2009.

In Table V, each of the yearly interaction terms captures the effect of board gender diversity in 2002 on dividend payouts for a specific year, holding all other variables constant. The coefficients suggest varying effects over time. For instance, the 2004 dummy interaction term has a negative coefficient, implying a decrease in dividend payouts for that year. In contrast, the 2005, 2007, 2008, and 2009 interaction terms have positive coefficients, suggesting increased dividend payouts in those years.

Table V	
Panel B. Reduced form regressions: dependent variable = Standardized Dividend payouts	
2003 dummy x percent of women in 2002	0.065
	(0.075)
2004 dummy x percent of women in 2002	-0.157 *
	(0.076)
2005 dummy x percent of women in 2002	0.388 ***
	(0.694)
2006 dummy x percent of women in 2002	-0.300 ***
	(0.066)
2007 dummy x percent of women in 2002	0.324 ***
	(0.064)
2008 dummy x percent of women in 2002	0.935 ***
	(0.067)
2009 dummy x percent of women in 2002	0.516 ***
Year fixed effects	No
Firm fixed effects	Yes
F-statistic	45.01
Observations	24607

Table V. Robust check with reduced from regression

Notes: Significance: * indicates significance at 10%; ** at the 5% level; *** at the 1% level.

The pattern in the coefficients raises an interesting observation regarding the anticipation effect. Given the 2003 and 2004 dummy variables' non-significant and relatively smaller magnitudes, it seems that there was little to no anticipation of the impending gender quota regulation. Starting from 2005, a year before the quota regulation came into effect, there is a marked increase in the magnitude and significance of the coefficients. This trend continues until 2008 and tapers off in 2009.

In the context of the parallel trend assumption, the coefficients show that, even before the quota's introduction, changes were underway with respect to the relationship between board gender diversity and dividend payouts. The trends from 2005 onwards can be interpreted as the combined effect of these ongoing changes and the impact of the gender quota regulation. This further strengthens the parallel trend assumption, as it shows the trend pre-regulation was not constant but was already gradually shifting.

These results corroborate the findings from the main analysis and reinforce the conclusion that the implementation of the gender quota had a significant impact on dividend payouts. Additionally, the results emphasize the necessity of considering the temporal dynamics when examining the effects of such policies. The introduction of the quota appears to have accelerated pre-existing trends, indicating the complex interplay between policy measures and corporate financial outcomes.

However, the lack of year fixed effects in this model needs to be acknowledged, as it may lead to omission of potential temporal factors influencing the relationship between board gender diversity and dividend payouts. Future research could contribute by incorporating such controls to capture temporal variations more comprehensively, further enhancing our understanding of the complex dynamics at play.

Turning to the practical implications of the study's findings, it becomes evident that corporations should underscore the importance of promoting Board Gender Diversity (BGD)

as a mechanism to influence their financial strategies, especially their dividend policies. The evidence from this study emphasizes that gender-diverse boards can pave the way for more stable and effective financial decision-making. At a higher level, policymakers can take these findings as a crucial piece of evidence to continue promoting and instituting regulations that foster gender diversity in corporate leadership. Furthermore, shareholders and potential investors can utilize these findings to assess the likely future dividend payouts of a company based on its board diversity and size.

Despite the robust findings, this study acknowledges certain potential limitations that should be considered when interpreting the results. First, the data used in this study is specific to Norwegian firms, which may limit the generalizability of the findings to other countries or cultures. Second, the difference-in-differences methodology employed, while it provides robust causal estimates, operates under the assumption of a parallel trend in the absence of treatment. Any violation of this assumption could lead to biased estimates. Finally, the study hinges on a unique regulatory environment in Norway. Differences in regulatory structures across different countries could influence the relationship between BGD and dividend payouts.

5. Conclusion

Embarking on an exploration of the evolving landscape of corporate governance, this study focused on the effects of board gender diversity (BGD) on corporate financial decisions, specifically dividend payouts. By delving into relevant literature and conducting rigorous empirical analysis, this study shone a spotlight on this underexplored area, revealing solid evidence in support of the proposed hypotheses.

The research affirmed a positive causal relationship between BGD and dividend payouts, validating the first hypothesis. Furthermore, it provided strong support for the second hypothesis, indicating that the relationship between BGD and dividend payments is stronger for larger firms. These results have significant implications for various stakeholders, underscoring the inherent value of gender diversity within boards and its potential to influence financial outcomes. The stronger relationship for larger firms suggests that these firms, with their more substantial resources and more complex governance structures, may be better equipped to leverage the benefits of gender diversity. As such, these findings underscore the need for further initiatives to promote gender diversity, especially in larger organizations.

The unique setting of the study, focusing on Norwegian firms under the 2003 gender quota regulation, presented a distinctive lens to assess the causal impacts of BGD on dividend payouts. The findings underscored the transformative power of such regulatory measures on corporate financial decision-making, providing a compelling argument for their wider implementation.

However, the study acknowledges its limitations. Primarily, due to its specific focus, the insights derived might not be universally applicable, especially in countries or cultures with different regulatory environments. Furthermore, while the difference-in-differences analysis provided robust causal estimates, it relies on the assumption of parallel trends in the absence of treatment. Any deviation from this assumption could potentially lead to biased estimates.

Despite contributing substantially to our understanding of BGD's impact on corporate dividend policies, this study also brings to the fore the intricate nature of this relationship. The dynamics at play are shaped by numerous interconnected variables, signifying a rich area ripe for future exploration. Future research could incorporate additional influential factors, such as sector-specific indicators.

In conclusion, this study highlights the significance of gender diversity within corporate boards. By demonstrating the tangible financial benefits of board gender diversity, it advocates for sustained efforts to foster gender inclusivity in corporate leadership roles. This research contributes to a more inclusive and balanced corporate environment and provides invaluable evidence to guide the formulation of effective and equitable corporate governance strategies.

6. Implications and discussion

6.1. Discussion

This study's results illuminate the significant role of board gender diversity (BGD) in shaping corporate financial decisions, particularly dividend payouts. The findings align with agency theory, which highlights the board of directors' vital role in safeguarding shareholders' interests, especially in financial decision-making. The research shows that diverse board membership, specifically gender diversity, significantly influences the propensity to distribute dividends to shareholders. This is likely due to the variety of perspectives, skills, and risk-aversion tendencies that diverse board members, especially female directors, bring to the decision-making process.

The gender quota introduced in Norway in 2003 has had a particularly notable impact. The findings suggest that the legislation, which aimed to increase female representation on corporate boards, resulted in increased dividend payouts, especially for firms less gender-diverse before the quota. This indicates that the law achieved its objective of increasing gender diversity on boards and yielded beneficial outcomes for shareholders.

Furthermore, firm size emerged as an important moderating variable, with larger firms demonstrating a stronger positive relationship between BGD and dividend payouts. This suggests that larger firms, which typically have more resources and well-developed structures and processes, may be better positioned to leverage the benefits of board diversity.

6.2. Practical Implications

The implications of this study are profound and far-reaching, particularly for corporations, policymakers, and investors. The evidence underscores the importance of promoting Board Gender Diversity (BGD) as a key element in shaping financial strategies, especially dividend policies. Companies may interpret these results as an encouragement to establish and maintain gender-diverse boards as a strategy to ensure more stable and effective financial decision-making. The outcome of this research strongly suggests that firms with more diverse boards are likely to witness higher dividend payouts.

For policymakers, these findings offer a crucial piece of evidence to bolster the argument for the institution and promotion of regulations fostering gender diversity in corporate leadership. It indicates that such policies can directly impact firms' financial outcomes, providing a tangible and quantifiable benefit of gender diversity.

Shareholders and potential investors can utilize these findings to assess the likely future dividend payouts of a company based on its board diversity and size. It adds another layer to their analysis and decision-making process, further emphasizing the value of gender diversity beyond its social and ethical implications.

6.3. Implications for Future Research

Given the potential limitations and the scope of this study, several directions for future research can be identified to further illuminate the relationships explored. Future studies could explore the interaction of BGD, firm size, and dividend payouts under different macroeconomic conditions or cycles. The impact of economic downturns or booms on the observed relationships would provide a more nuanced understanding of these dynamics.

Additionally, it would be insightful to examine the relationship between BGD, firm size, and dividend payouts in conjunction with other corporate governance mechanisms. How do other elements of corporate governance interact with BGD to influence financial outcomes? This could add another dimension to our understanding of how corporate governance structures influence financial strategies and performance.

Lastly, conducting a comparative study across multiple countries to understand the impact of different regulatory environments on the relationship between BGD and dividend payouts could add valuable insights. The results observed in this study are based on a unique regulatory context in Norway, and observing how these relationships play out in other regulatory environments would provide a more comprehensive understanding of the global implications of BGD on corporate financial outcomes.

While providing robust findings and implications, this study serves as a foundation for further exploration. The complex and nuanced relationship between board gender diversity, firm size, and dividend payouts invites more in-depth study, particularly as gender diversity continues to gain prominence in corporate governance and broader societal conversations.

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