

Research article

Board Gender Diversity and Firm's Financial Performance: Further Evidence from an Emerging Capital Market

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Abstract: The purpose of this study is to investigate the impact of organizational learning levels (individual, group, organization, feed forward, and feedback) on dynamic capability dimensions (sensing opportunities and threats, seizing opportunities, managing risks & reconfiguration). Furthermore, this study presented a set of recommendations to help the pharmaceutical industry establish administrative capabilities that will enable it to keep up with the frequent changes in the competitive environment. In this regard, the researcher employed a variety of statistical approaches to validate the hypotheses, including tests of validity and reliability, and multiple regression analysis. The results of the study concluded that there is a positive and significant impact of organizational learning levels on the dimensions of sensing opportunities and threats, and risk management & reconfiguration, while the study doesn't support the assumed relationship of organizational learning dimensions on dimension of seizing opportunities, where the positive and significant impact is limited to the level of the individual, the organization, feed-forward, and feedback. Hence, the results did not prove a significant effect of learning at the group level after seizing opportunities.

Keywords: Board of directors; Corporate governance; Gender diversity; Firm's value.

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1. Introduction

The number of female representatives on the board of directors is slowly but steadily increasing. Many countries encourage females to sit on the board of directors, and some of them even require companies to hire at least one female director. In this regard, the most well-known example is Norway. Since 2006, female representation on the board of directors of large companies must reach at least 40%.

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Therefore, Norway currently has 42% female representatives on the board of directors (Carter, D'Souza, Simkins, & Simpson, 2010; Randøy, Thomsen, & Oxelheim, 2009; Rose, 2007). Binding sanction quotas are also implemented in Belgium and Italy (33% quota) and France (40% quota). In other countries, quota legislation is applied without sanctions; for example, in Spain (40%) and the Netherlands (30%). Gender equality issues have also appeared on the Egyptian political agenda. The main purpose of these regulations is to promote the recruitment of females on the firm's board of directors, thereby creating an effective board that can protect the interests of shareholders. These developments have aroused interest in the connection between board gender diversity and a firm's financial performance.

The increase in gender diversity in the boardroom and senior management positions has become a major focus of government concern. Therefore, this study examines the impact of board gender diversity on Egyptian firms' financial performance, considering the growing convergence towards the Anglo-American corporate governance model. Greater female representation on the board of directors is generally based on four criteria: improved performance, access to a wider talent pool, increased market responsiveness and strengthening corporate governance (Daniel, Low, Helen, & Rosalind, 2015). However, the existing literature focuses largely on US companies. Little empirical work has been done to examine the link between board gender diversity and the firm's financial performance in Egypt.

This article aims to study the impact of the presence of a female on the board of directors on the firm's financial performance. We examine the relationship between the firm performance and the board gender diversity, which is measured as the percentage of female directors in the firm's total number of board members. We use the Tobin Q to measure the firm's financial performance. In other words, a higher number of females in top positions or on boards of directors will result in increased firm productivity and profitability.

This study has made some contributions to the existing literature. First, there is little empirical evidence on the relationship between gender diversity and firm financial performance in developing countries. Most previous research is based on data from developed markets. Therefore, this study provides empirical evidence from the literature on the relationship between board gender diversity and firm financial performance in emerging economies. Second, an increasingly important role of the female in the company's board of directors has been the subject of intense political debate in Egypt and is now

actively defended for ethical reasons to correct the perception that Egyptian female is underrepresented in business and society more generally; in this case, the results reinforce the existing evidence in the Egyptian context, showing that female on the board of directors can improve the firm's financial performance. Third, our analysis uses the panel data method, which is more effective in controlling unobservable heterogeneity, which is a factor that most published studies ignore.

The remainder of the article is organized as follows. Section 2 presents the theoretical framework. Section 3 briefly reviews the literature and formulation of hypotheses. Section 4 describes the research methodology. Section 5 examines the results and discusses the findings. Finally, the last section concludes the paper.

2. Theoretical Framework:

The research on board gender diversity has mixed theoretical propositions. Therefore, no single theory can predict the relationship between females on the company's board of directors and the firm's financial performance (Carter et al., 2010). However, the two main and important theories used to support the board gender diversity research are agency theory and resource dependency theory.

2.1 Agency theory

Agency theory involves the separation of ownership from control and the relationship between principal/owner and manager/agent. The theory also shows that the board of directors monitors and controls managers (Arslan, Karan, & Ekşi, 2010; Fama & Jensen, 1983; Jensen & Meckling, 1976). All boards are formed to overcome the agency's problems and help improve the board's effectiveness. The board performs strategic functions, such as supervision, consultation, and diverse backgrounds (male and female members) to bring a variety of business ideas, opinions, experiences, and insights to the board's decision-making process, which will ultimately improve the firm's financial performance (Khosa, 2017; Lincoln & Adedoyin, 2012; Ntim, 2013; Triana, Miller, & Trzebiatowski, 2014). Diversified counseling can help strengthen the role of females in aligning management's interests with those of shareholders (Hillman & Dalziel, 2003).

Agency theory is one of the main theories used to explain the positive impact of board gender diversity on a firm's financial performance. From the perspective of agency theory, gender diversity is one of the most important corporate governance mechanisms of a company (Gallego-Álvarez, García-Sánchez, & Rodríguez-Dominguez, 2010). In this framework, a board gender diversity can better

control the board because a wide range of views and opinions can improve the independence of the board (Reguera-Alvarado, de Fuentes, & Laffarga, 2017). Hence, gender diversity on a board can be a mechanism that reduces the costs related to agency problems (Reguera-Alvarado et al., 2017). Furthermore, females' unique experience, knowledge, and expertise, and the unique nature of social and business ties can help provide access to more market knowledge and resources, making female directors invaluable to the board (Wittenberg-Cox & Maitland, 2008).

The empirical results show that board gender diversity has a significant and positive relationship with a firm's financial performance (even a company with better governance). When the company appoints female directors, they will find that the firm's financial performance will increase due to additional monitoring (Carter, Simkins, & Simpson, 2003; Isidro & Sobral, 2015), which can narrow the scope of agency problems (Liu, Wei, & Xie, 2014; Ntim, 2013). Our results are consistent with the predictions of agency theory.

2.2 Resource dependence theory

Resource dependence theory is one of the most theories in corporate governance that provides the general theoretical basis on how board diversity can affect the decision-making process on board (Pfeffer & Salancik, 2003). According to (Carter et al., 2010), resource dependence theory provides the basis for some of the most convincing theoretical arguments for a business case for board diversity. Resource dependence theory views organizations as operating in an open system and depending on external organizations and environmental contingencies to survive and obtain resources, creating a dependency between firms and external units (Hillman & Dalziel, 2003; Pfeffer & Salancik, 2003; Setó-Pamies, 2015).

A diversified board of directors can be linked to the firm's external environment and resources (including skills, board member experience, reputation, and legitimacy), and it will have an impact on the firm's financial performance (Arnegger, Hofmann, Pull, & Vetter, 2014; Ntim, 2013). During the selection procedure for the board of directors, firms can hire a person with a particular skill, experience, or an important linkage to the external environment (Marlin & Geiger, 2012). Moreover, organizational needs depend upon the changes in environmental dependencies. Thus they increase the requirements for specific types of directors (Hillman, Shropshire, & Albert A. Cannella, 2007). Therefore, the rationale behind the resource dependence theory is board diversity improves overall board expertise and the number of important external linkages to the firm's environment (Hillman et

al., 2007; Marlin & Geiger, 2012). Therefore, the connection between female directors and external resources can increase critical resources, thus improving the firm's financial performance (Reguera-Alvarado et al., 2017).

When females become part of the firm's success, this will encourage the board to recruit more females of equal talent. At the same time, other potential members will be motivated and encouraged to apply for vacancies. Gender diversity can be used as a powerful tool to promote gender equality. Therefore, our empirical evidence supports the resource dependency theory, showing that board gender diversity can improve decision-making and help align the organization with its environment and external resources, thus improving the firm's financial performance. These benefits are that females can bring various attributes, experiences, and ideals (Adams & Ferreira, 2009; Baranchuk & Dybvig, 2008; Carter et al., 2010; Carter et al., 2003).

Several researchers believe that the board gender diversity is attributed to the agency and resource dependence theories (Burgess & Tharenou, 2002; Dwyer, Richard, & Chadwick, 2003; Goodstein, Gautam, & Boeker, 1994; Ntim, 2013; Yang & Konrad, 2011). This article follows the examples of these researchers and uses the same theory. Both theories show that the representation of females on the board tends to increase the firm's financial performance.

3 Literature Review and Formulation of Hypotheses

3.1 Board gender diversity and firm financial performance

As the proportion of females in the workforce increases, the number of potential business candidates is undergoing major changes. Despite the board of directors being a visible reflection of the diversity of the workforce, diversity also affects the composition of the board of directors (Mahadeo, Soobaroyen, & Hanuman, 2012). Gender diversity is one of the most important governance issues and is considered an integral part of good corporate governance

Previous researchers (Adler, 2001; Campbell & Mínguez-Vera, 2008; Gyapong, Monem, & Hu, 2016; Nguyen, Locke, & Reddy, 2015; Ntim, 2013; Perryman, Fernando, & Tripathy, 2016) and other empirical literature reported that diversity of board could improve performance. The latest research by Perryman et al. (2016), using data from the USA from 1992 to 2012 and Tobin's Q as an indicator of financial performance, shows that companies with a greater diversity of gender in leadership have less risk of higher performance.

Some of the arguments in the previous literature support the positive impact of female directors on firm financial performance. First, gender diversity can improve problem-solving skills by inserting various perspectives into board discussions. Second, board gender diversity means that diversified managers can increase both firm's profitability and value by adding unique characteristics, skills, and talent to the board (Campbell & Mínguez-Vera, 2008; Carter et al., 2010). Therefore, boards of directors with different abilities, cultural backgrounds, and genders provide strategic resources to improve the firm's financial performance.

(Francoeur, Labelle, & Sinclair-Desgagné, 2008) Used a sample of 500 of the largest Canadian listed companies between 2001 and 2004 to examine whether the participation of females on board can increase the firm's financial value. The findings indicate that companies with a high proportion of female officers have achieved significant abnormal returns. (Campbell & Mínguez-Vera, 2008) they have used panel data analysis of Spanish-listed companies. A study conducted in 2008 showed that board gender diversity has a positive impact on firm value. (Adler, 2001) used data from 25 American-listed companies and found a positive correlation between the employment of a higher percentage of females in senior management and the firm value (Tobin's Q). This empirical study shows that hiring some females on the board can improve performance.

(Lückerath-Rovers, 2013) examined the effect of female directors on firm performance in a sample of Dutch listed companies and deduced that firms with female directors on their boards performed better than others. Similarly, (Liu et al., 2014) found a significant positive relationship between gender diversity and firm financial performance in Chinese listed companies. Furthermore, (Ntim, 2013) found in the South African stock market study that board gender diversity is statistically significant and positively correlated with firm value (Tobin's Q). (Isidro & Sobral, 2015) found a positive association between board gender diversity and firm financial performance in a European listed company. (Nguyen et al., 2015) conducted a sample of 120 listed companies in Vietnam for four years from 2008 to 2011. Their result indicates that board gender diversity appears to positively impact firm value, where Tobin's Q served as a measure of firm financial performance.

(Low, Roberts, & Whiting, 2015) showed that the increasing number of female directors positively impacts firm financial performance, especially in a sample of Asian companies, including Hong Kong, South Korea, Malaysia, and Singapore. (Gyapong et al., 2016), used data collected manually from listed companies in South Africa from 2008 to 2013 and recorded a significant and positive impact of

the board's gender and ethnic diversity on firm value. They believe that a board composed of three or more female directors is expected to increase the firm's value, where Tobin's Q can be used to measure the firm's financial performance. (Galbreath, 2018), used data from Australian listed companies shows that females on the board of directors positively affect the firm's financial performance. Also, the results indicate that the female's representation on the board and financial performance may be affected by corporate social responsibility. (Perryman et al., 2016), used data from 1992 to 2012 in the United States and Tobin's Q as a measure firm financial performance, the study shows that companies with large gender diversity in their leaders have less risk and higher performance.

The empirical evidence of board gender diversity and firm financial performance is not conclusive, contradictory, and sometimes even inconsistent. Thus, some studies have reported a negative relationship between board gender diversity and firm financial performance (Adams & Ferreira, 2009; Darmadi, 2011; Shrader, Blackburn, & Iles, 1997; Wang & Clift, 2009). For instance, (Shrader et al., 1997) studied the relationship between the proportion of female directors in a sample USA and a firm's financial performance and deduced that gender diversity reduced firm financial performance. (Wang & Clift, 2009), used data of the top 500 Australian companies for investigating the relationship between board gender diversity, as represented by the percentage of female and firm financial performance. The results indicate that board gender diversity does not significantly influence firm financial performance. Besides, it is reported that larger firms tend to have relatively more female members, and smaller firms or firms with larger boards may have more minority directors.

Similarly, (Adams & Ferreira, 2009) reveal the average effect of gender diversity on the firm financial performance is negative despite the enhanced board effectiveness. They used Tobin's Q as a market-based measure of performance. (Darmadi, 2011) used data from the Indonesia Stock Exchange to test whether the presence of females on board has a negative effect on the firm's financial performance (Tobin's Q). Research shows that a female director of the Indonesian board of directors may be present due to family relations than professional experience and occupational expertise.

Other studies could find no association (Carter et al., 2010; Marimuthu & Kolandaisamy, 2009; Rose, 2007). For instance, (Rose, 2007) used a sample of Danish-listed firms between 1998 and 2001 to study whether a female on board affected firm financial performance but found no significant relationship between firm performance and female board representation. (Marimuthu & Kolandaisamy, 2009) Used a sample of Malaysian listed companies from 2000 to 2006 to examine

demographic diversity's effect on firm financial performance. The results indicate a nonsignificant relationship between gender diversity and firm financial performance. (Carter et al., 2010) used data from the S&P 500 index and failed to verify a significant association between gender and ethnic diversity of boards and firm financial performance; this means female and ethnic diversity had no material impact on the S&P-listed firms.

However, we predict a positive and statistically significant relationship between board gender diversity and firm financial performance, given the mixed international evidence. Therefore, our main hypothesis to be tested in this study is:

H₁: There is a positive relationship between board gender diversity and firm financial performance as measured by Tobin's Q.

3.2 Board characteristics and firm financial performance

The primary responsibility of the board of directors, as identified by the Egyptian Corporate Governance Code (2016), is to present a fair, balanced, and understandable evaluation of the company's position and prospects. Accordingly, board effectiveness is a critical element in minimizing agency costs and improving the firm's disclosure and transparency. Therefore, the board of directors' characteristics could influence a firm financial performance. The current study examines four characteristics: board size, independent directors, duality in position, and board frequency of meetings. Board size is the number of executive and non-executive directors on the firm's board. Agency theory indicates that large boards can play a pivotal role in monitoring the board and making long-term decisions. There is no agreement on the impact of board size. While larger boards provide more gender diversity and expertise that may support the monitoring role and enhance the board effectiveness, such boards are criticized for the poor communication and coordination and the free-rider problem. The empirical studies found that the relationship between board size and firm financial performance has mixed results. There is evidence of a positive and significant association with the firm financial performance in Vietnam (Adhikary, Huynh, & Hoang, 2014) and New Zealand (Fauzi & Locke, 2012), suggesting that larger boards increase firm performance than smaller boards. On the other hand, some studies show a negative relationship between board size and firm financial performance (Guo & Kga, 2012; Kota & Tomar, 2015).

The large proportion of independent board members confirms the overall size of the board's independence, which means that the monitoring results will be more effective if the board members

are not biased. Consequently, independent directors may influence decisions and operations, investment and financial activities, and internal control mechanisms. Previous literature has revealed the effect of board independence on firm financial performance (Adhikary et al., 2014; Darmadi, 2011; Nguyen et al., 2015; Ntim, 2013; Yang & Konrad, 2011). According to agency theory, independent members play a better monitoring role than non-independent members, as they do not pursue their interests. (Adhikary et al., 2014) found that a high percentage of independent directors in Vietnam could increase firm performance. (Gul & Leung, 2004) report a negative association between firm financial performance and board independence in Hong Kong.

The function of duality in position exists when the CEO (Chief executive officer) is also the chairman of the board at the same time. Agency theory expects that role duality creates a single authority for the CEO, affecting the board's controlling effectiveness. Several empirical studies have examined the relationship between CEO duality and earnings management. However, the evidence is mixed. (Dahya, Lonie, & Power, 1996) report a positive association between the role duality and financial performance. Specifically, they use a sample of 124 UK companies from 1989 to 1992 and find an improvement in firm performance following the separation of CEO and board chairperson roles. On the other hand, many studies find that role duality is insignificantly associated with firm financial performance (Bozec, 2005; Castañer & Kavadis, 2013; Daily & Johnson, 1997).

The frequency of board meetings indicates the total number of board meetings, which is a proxy for the board diligence and the level of monitoring of the board's activities. Frequent board meetings are an essential tool for corporate governance because it helps the board of directors effectively control the company's operations (Karamanou & Vafeas, 2005). The theoretical association between the frequency of board meetings and financial performance is mixed. Prior studies provide evidence that a positive impact of frequent board meetings on firm performance (Karamanou & Vafeas, 2005; Upadhyay, Bhargava, & Faircloth, 2014). However, some prior studies have reported a negative relationship between the frequency of board meetings and firm financial performance (Christensen, Kent, Routledge, & Stewart, 2014; Fich & Shivdasani, 2006; Jackling & Johl, 2009)

Based on the above discussion, we test the impact of board characteristics on firm financial performance as per the following hypothesis:

H₂: There is a relationship between board characteristics and firm financial performance.

H_{2.1}: There is a negative relationship between board size and firm financial performance.

H_{2.2}: There is a positive relationship between independent directors and firm financial performance.

H_{2.3}: There is a negative relationship between duality in position and firm financial performance.

H_{2.4}: There is a positive relationship between board frequency of meetings and firm financial performance.

4 Research Methodology

4.1 Sample and data collection

It is assumed that most active firms on a stock exchange are more readily attracting the interest of investors and more likely to disclose more information and apply the best practice of corporate governance (Mohd Ghazali & Weetman, 2006). Therefore, our study sample encompasses the 100 most active firms in the Egyptian Exchange (EGX) according to trading value as per the EGX100 index. However, due to the political instability after the Egyptian revolution in January 2011, we decided to examine our sample for six years, from 2010 until 2017.

The total initial sample consists of 100 annual reports. As this study focuses on non-financial listed companies, therefore; banks, insurance, and financial services companies (n=8) are excluded. Furthermore, we discarded another four companies with missing data. Consequently, the total number of sample companies is reduced from 100 to 88. In this sense, (Christensen et al., 2014) believe that the panel data improves the estimation efficiency because this type of data adds observations more than time-series data and cross-sectional data. As a result, the final sample consisted of only 88 firms and 704 firm-year observations across 9 different industries, representing approximately 88% of the initial sample of listed companies on the EGX. Compared to previous studies, (Mohd Ghazali & Weetman, 2006) used 87 annual report samples of Malaysian companies; (Cheng & Courtenay, 2006) used 104 Singapore companies. Recently, (Elfeky, 2017) used a sample of 50 annual reports of Egyptian listed companies. To test the research hypotheses, we collected the annual reports of selected firms from their websites. Table (1) outline the total number of the final sample examined in this study, while Table (2) demonstrates the distribution of the sample firms across the various 9 industries.

Table (1): Final sample construction

Description	Number of Companies
Initial sample	100
<i>Less:</i> Financial companies	<u>(8)</u>
Non-financial companies	90
<i>Less:</i> Missing data	<u>(4)</u>
Total number of final samples	<u>88</u>

Table (2): Sector representation of selected companies

Sector	Number of Observation	% of sample
Real Estate	144	20.45
Food and beverage	128	18.18
Construction and Materials	112	15.91
Healthcare and Pharmaceuticals	40	5.68
Industrial Goods and Services and Automobiles	88	12.50
Travel & Leisure	64	9.09
Basic Resources	40	5.68
Chemicals	32	4.55
Personal and Household Products	56	7.95
Total	704	100%

4.2 Research Model

To examine the relationship between board gender diversity and firm value, we measure the firm value using Tobin's Q (Q-ratio) as a market-based measure. Table (3) describes the model variables, symbols, definitions, and descriptions.

$$Tobin's\ Q = \beta_0 + \beta_1 GEND_{jt} + \beta_2 BOIND_{jt} + \beta_3 BOSIZE_{jt} + \beta_4 DUALT_{jt} + \beta_5 BFMT_{jt} + \beta_6 FSZ_{jt} + \beta_7 LEVRG_{jt} + \beta_8 ROA_{jt} + \beta_9 Big4_{jt} + \beta_{10} YDU_{jt} + \varepsilon$$

Table (3): Model variables, symbols, definitions, and descriptions

<u>Variable</u>	<u>Full name</u>	<u>Variable Description</u>
<u>Dependent Variable</u>		
Tobin's Q	Tobin's Q	The firm value is measured by Tobin's Q (Q -ratio) as a ratio of (the firm's total debt plus the total market value of equity) to the book value of its assets.
<u>Independent Variables</u>		
$GEND_{jt}$	Gender diversity	GEND is the percentage of female directors to the total number of directors on the firm's board.
$BOSIZE_{jt}$	Board size	BOSIZE is a number of the board of directors' members.
$BOIND_{jt}$	Independent directors	BOIND is the ratio of independent (non-executive) directors to total board size.
$DUALT_{jt}$	Duality in position	DUALT is a dummy variable; 1 if the company's CEO serves as a board chairman, 0 otherwise.
$BFMT_{jt}$	Board frequency meeting	BFMT is a number of the board of directors' meetings in a financial year.
<u>Control Variables (Firm Characteristics)</u>		
FSZ_{jt}	Firm size	FSZ is measured as the natural logarithm of the book value of total assets for the firm j and period t .
$LEVRG_{jt}$	Firm leverage	LEVRG is measured as long-term debts divided by capital equity.
ROA_{jt}	Firm profitability	ROA refers to return on assets, measured as the net income ratio to total assets for the firm j and period t .
$Big4_{jt}$	Auditor type	Big4 is a dummy variable, one if the auditor is one of the Big4, 0 otherwise.
YDU_{jt}	Year dummies	A dummy variable for each year of the sample period (eight years) from 2010 to 2017.

4.3 Variables measurements

4.3.1 Dependent variable

Previous literature reviews revealed (Tobin's Q) as a measure (proxy) of firm value by providing critical prior research that proposes the relationship between voluntary corporate disclosure practice and firm value. Generally, many recent studies on firm value using voluntary corporate disclosure practices have applied mainly market-based measures, such as Tobin's Q , as proxies for firm value. In line with empirical studies from recent literature on firm value, this study adopts a market-based measure for three main reasons. First, there appears to be a lack of consensus in the literature about the optimal measurement to evaluate firm value (Mangena, Tauringana, & Chamisa, 2012). Therefore,

this study focuses on Tobin's Q, as it is more widely used in corporate governance studies (Adhikary et al., 2014; Gyapong et al., 2016; Mangena et al., 2012). Second, this measure was adopted to enhance comparability with existing studies. Third, using market-based measures provides a robustness check for the results. Therefore, as a firm performance proxy, the Q-ratio help in measuring the impact of gender diversity on firm financial performance.

Tobin's Q uses company valuations to measure performance, determined as market capitalization plus total debt divided by total assets (Low et al., 2015). Several researchers calculate the market value in several ways (Elfeky, 2017; Perryman et al., 2016; Triana et al., 2014). Tobin's Q is the relationship between the market value of the company and the book value. The company's market value is calculated based on the book value of the assets less the book value of capital plus the market value of the capital. It is also calculated as the market value of the assets divided by the book value of the assets. Following prior studies and as shown in Table (3), it is calculated as (the firm's total debt plus the total market value of equity) divided by the total book value of assets (Mangena et al., 2012).

4.3.2 Independent variables

The main independent variable is on-board gender diversity (GEND). Four board characteristics are included in the model to test the second hypothesis. These are board size (BOSIZE), board independence (BOIND), role duality (DUALT), and board frequency meetings (BFMT) (Christensen et al., 2014; Galbreath, 2018). This study follows prior studies to define and measure these independent variables (see Table 3).

4.3.3 Control Variables: Firm Characteristics

This study includes firm-specific characteristics as control variables broadly used by prior studies. Hence, we introduce firm size, so it is reasonable to suppose that a large firm size (FSZ) has a sufficient effect on firm financial performance (Arnegger et al., 2014). Firm size is measured by calculating the natural logarithm of total assets. We also control for leverage (LEVRG). Companies with a high leverage ratio are considered risky. Hence, managers seek to reassure stakeholders by disclosing more detailed information (Jackling & Johl, 2009). Leverage was calculated as long-term debts divided by capital equity. We control for firm profitability (ROA) since some of the existent literature on board diversity recommends that profitable firms whose financial performance is strong are more likely to contribute to society's well-being through engagement in social and environmental activities (Campbell & Mínguez-Vera, 2008).

Further, directors of profitable companies enjoy more flexibility and independence to publish extensive social and environmental information in their annual reports to stakeholders (Gul & Leung, 2004). Profitability was calculated as the ratio of total return on total assets. It is essential to control for auditor type (Big4). The logic in this context is; that companies audited by one of the four big audit firms are more likely to play a crucial role in reporting sustainability information (Pfeffer & Salancik, 2003). Big four is a dummy variable representing auditor type; that is, the coded value of 1 if the company is audited by one of the big four accounting firms, 0 otherwise. Finally, corporate sustainability performance is subject to business cycle fluctuations (year fixed effects). In this light, the effect of years is controlled by introducing year fixed effects (YDU) to capture any variation in the output that exists over time which reflects business cycle and macroeconomic fluctuations. In other words, we control for unobserved heterogeneity by adding year dummies to our econometric model.

5 Results and discussion

5.1 Descriptive analysis

Table (4) shows the descriptive statistics for the study variables. The result of the Q-ratio (Tobin's Q) is defined as a ratio of a firm's total debt plus the total market value of equity to the book value of its assets. The highest average ratio among the sampled firms is 1.22, ranging from 0.03 to 9.72. Moving to gender diversity, the mean value of gender diversity (GEND) on the board is nearly 0.07. The minimum number of female directors was zero members, whereas the maximum number was 4 members. The average board size (BOSIZE) is about 8 members with a minimum of 3 and a maximum of 19 members. Also, it is notable that the average of non-executive directors (BOIND) is about 74% which suggests that most board members are non-executives. It ranges from 0% to 100%. Duality in position (DUALT) is a dummy variable (if the company's CEO serves as a board chairman or not). The average duality in position is about 65%, ranging from 0 (CEO does not serve as a board chairman) to 1 (CEO serves as a board chairman). The frequency of meeting the board of directors (BFMT) is measured by the number of the board's meetings in a financial year. It ranges from 3 to 24 meetings; the average board frequency meeting is about 10 meetings. The analysis of firm size (FSZ) which measured by the natural log of firms' total assets. The range of the firm size variable is between 7.5 million and 16 million, with an average of 11.26 million. The mean of a firm size slightly increases over the sample period. The firm leverage (LEVRG) among Egyptian listed firms is 45%, with a

maximum value of 46% and a minimum value of 0.4%. Average firm profitability (ROA) is about 4% and ranges from -83% to 52%. Regarding auditor type (Big4), about 36% of firms are audited by one of the Big4. Finally, the year as a dummy (YDU) variable with an average of 4.5 ranges from 1 year to 8 years.

Table (4): Descriptive statistics

Variable	Observation	Mean	S. D.	Minimum	Maximum
Dependent variable					
Tobins Q	704	1.220293	0.92957	0.027337	9.71904
Independent variable					
Gender diversity	704	0.071687	0.108354	0	4
Board size	704	7.961648	2.734835	3	19
Independent directors	704	0.74326	0.180313	0	1
Duality in position	704	0.653409	0.476222	0	1
Board frequency meeting	704	9.640625	4.176422	3	24
Control variables					
Firm size	704	11.26829	1.687867	7.514255	16.06389
Firm leverage	704	0.455386	0.318979	0.004769	4.686942
Firm profitability	704	0.040189	0.106072	-0.83847	0.517412
Auditor type	704	0.363636	0.481388	0	1
Year dummies	704	4.5	2.292917	1	8

5.2 Correlation matrix

Table (5) presents the correlation matrix among all variables of our model. The Table reveals a positive correlation between board gender diversity and firm financial performance measured by the Q-ratio. While Tobin's Q is negatively correlated with board independence, firm size, and auditor type, it is positively correlated with board size, duality in position, and Board frequency of meetings. All correlation coefficients are below 80%, indicating no serious multicollinearity (Gujarati & Porter, 2013)(Gujarati & Porter, 2013). The variance inflation factor (VIF) results show the maximum VIF is 2.04 and the mean VIF is 1.47. Moreover, the lowest tolerance coefficient is 0.49. Therefore, there is no unacceptable level of multicollinearity.

Table (5): Correlation Matrix

	Tobins <i>Q</i>	GEND	BOSIZE	BOIND	DUALT	BFMT	FSZ	LEVRG	ROA	Big4	YDU
Tobin's <i>Q</i>	1.0000										
GEND	0.1186	1.0000									
BOSIZE	0.0112	0.1210	1.0000								
BOIND	-0.0174	0.0261	0.3593	1.0000							
DUALT	0.0924	0.1002	0.0018	-0.2010	1.0000						
BFMT	0.1263	-0.0808	-0.1111	-0.1441	0.1369	1.0000					
FSZ	-0.1204	-0.0974	0.3784	-0.0097	-0.0320	0.0162	1.0000				
LEVRG	0.2532	-0.0285	-0.0679	-0.1952	0.0543	0.1059	0.1240	1.0000			
ROA	0.0034	-0.0379	0.1167	0.0748	0.0184	0.1007	0.1643	-0.3795	1.0000		
Big4	-0.0448	-0.1373	0.1922	0.0624	-0.1251	-0.1005	0.4220	0.1131	0.0922	1.0000	
YDU	0.0643	0.0475	0.0492	0.0029	-0.0102	0.0783	-0.1187	0.1067	-0.0881	0.0061	1.0000

5.3 Regression results

Table (6) summarizes the results of the OLS regression analysis. The F-value is 11.24 ($P = 0.000$), which indicates that the study model is statistically significant. Moreover, the adjusted value of the determination coefficient ($Adj.R^2$) = 0.1273, implying that the independent variables explain 12.73% of the firm's financial performance variation. The model is statistically effective for explaining the firm's financial performance variation. Therefore, the regression analysis results can be interpreted with greater confidence.

Regarding the independent variables' results, Table (6) shows that the board gender diversity is positively and significantly correlated with the firm's financial performance measured by Q-ratio (significance level is 1%). Moreover, the analysis shows that board size is positively correlated with the firm's financial performance and statistically significant at 10%. Furthermore, we also find a significant positive correlation for both independent directors' ratio and duality in position with a firm's financial performance. Additionally, the analysis shows that the board frequency of meetings is positively and significantly correlated with a firm's financial performance (significance level is 5%). As for control variables, we also find a significant negative correlation between firm size and the firm's financial performance (significance level is 1%). Moreover, the analysis shows that firm leverage and profitability are positively correlated with a firm's financial performance and are statistically significant at 1%. In terms of the quality of the auditing environment, we find a positive and insignificant correlation between auditor type and the firm's financial performance.

Table (6): OLS regression results

Tobin's Q	Coef.	Std. Err.	T	P>t	[95% Conf.]	[Interval]
Independent Variables						
Gender diversity	0.911018	0.313131	2.91	0.004***	0.296217	1.525819
Board size	0.028422	0.014526	1.96	0.051*	-9.8E-05	0.056942
Independent directors	0.128979	0.205908	0.63	0.531	-0.2753	0.533259
Duality in position	0.090906	0.071979	1.26	0.207	-0.05042	0.23223
Board frequency meeting	0.021127	0.008256	2.56	0.011**	0.004917	0.037336
Control Variables (<i>firm characteristics</i>)						
Firm size	-0.11508	0.024072	-4.78	0.000***	-0.16234	-0.06781
Firm leverage	0.976671	0.11789	8.28	0.000***	0.745206	1.208136
Firm profitability	1.284231	0.34926	3.68	0.000***	0.598495	1.969967
Auditor type	0.008199	0.077396	0.11	0.916	-0.14376	0.160158
Year dummies	0.000185	0.01474	0.01	0.990	-0.02876	0.029125
_cons	1.366993	0.316703	4.32	0.000	0.745178	1.988807
F – value	11.24	*** Significant at 1%, ** Significant at 5%, and * Significant at 10%.				
Prob. > F	0.0000					
R–Squared	13.98%					
Adj. R ²	12.73%					

6 Conclusions

Due to the weak corporate governance mechanism and low efficiency, many company scandals and failures have been many. Hence, the gender composition of the boards has attracted significant attention from many political parties due to its impact on governance, including policy-makers, regulatory bodies, governments, companies, managers, and shareholders. The main argument used in this case is that female is different; more specifically, female is more inclined to avoid risks and pay more attention to long-term prospects. The political debate is largely formed by the argument against discrimination, which involves female in powerful positions. Therefore, there are doubts about the economic impact of board gender diversity due to contradictions. Therefore, the economic debate about whether female directors can improve a firm's financial performance is a huge research area.

We document evidence that increasing numbers of female directors on the board positively affect firm performance, particularly the initial appointment. We also find that a country's more supportive attitude towards female at work positively enhances the prevalence of gender-diverse boards. The country's attitude towards female may moderate the impact on firm financial performance. More specifically, the likelihood of appointing the first female director on the board is enhanced in countries where

female's acceptance in the workforce is higher. However, surprisingly we find that the benefits of female directors on firm financial performance are decreased when such a supportive and accepting culture for female in employment is present and augmented in countries where female's participation and empowerment in the workforce are more constrained.

Several limitations of this study need to be addressed. First, gender is simply one aspect of board diversity. Hence, future studies need to examine the impact of other characteristics of board diversity, such as age, education, experience, and culture, on firm performance. Second, it is possible to conduct this research in similarly emerging countries to compare these findings. Third, there are only a small number of females participating on Egyptian boards to date. Thus, future studies should re-examine the relationship between gender diversity and firm performance after the legislation regarding gender quotas has been implemented. Fourth, this study should use market-based performance measures such as share price as other measures for future research. Finally, different methodologies, such as case studies or surveys, may be useful for a detailed understanding of the issues created by gender diversity in Egyptian companies.

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التنوع بين الجنسين في مجلس الإدارة والأداء المالي للشركة "دراسة تطبيقية"

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الملخص: تستهدف هذه الدراسة التعرف على أثر التنوع بين الجنسين في مجلس الإدارة والأداء المالي للشركات المدرجة بسوق الأوراق المالية المصرية. ولتحقيق هذا الهدف فإن العينة النهائية عبارة عن 704 مشاهدة تمثل بيانات 88 شركة من الشركات غير المالية المدرجة بالبورصة المصرية والمدرجة بمؤشر EGX100 متمثلة في 9 قطاعات صناعية مختلفة خلال الفترة من 2010 إلى 2017. وتم استبعاد القطاع المالي من العينة لما لهذا القطاع من خصائص محددة وقوانين ولوائح خاصة به. واستخدمت الدراسة مقياس Tobin Q كمؤشر للأداء المالي للشركة، كما تم استخدام مقياس نسبة تمثيل الإناث بمجلس إدارة الشركة كمؤشر للتنوع بين الجنسين في مجلس الإدارة. بالإضافة إلى استخدام نموذج المربعات الصغرى (OLS) لاختبار أثر تمثيل العنصر النسائي بمجالس إدارات الشركات محل العينة على الأداء المالي لتلك الشركات. وقد توصلت الدراسة إلى وجود علاقة إيجابية ذات دلالة إحصائية بين نسبة تمثيل الإناث بمجلس إدارة الشركات والأداء المالي لتلك الشركات. كما يتضح من بيانات الدراسة، أن النتائج التي توصلنا إليها مرنة في استخدام مقاييس مختلفة للتنوع بين الجنسين في مجلس إدارة الشركات. كما توصلت الدراسة إلى وجود علاقة إيجابية معنوية بين كل من: حجم مجلس الإدارة؛ واستقلالية أعضاء مجلس الإدارة؛ وازدواجية دور المدير التنفيذي؛ وعدد اجتماعات مجلس الإدارة. أما بالنسبة للمتغيرات الرقابية للدراسة، توصلت الدراسة إلى وجود علاقة إيجابية معنوية بين كل من: نسبة الرافعة المالية؛ ونسبة ربحية الشركات في علاقتها بالأداء المالي للشركة. كما أشارت الدراسة إلى وجود علاقة سلبية معنوية بين حجم الشركة وأدائها المالي، بينما أشارت الدراسة إلى عدم وجود علاقة معنوية بين حجم مكتب المراجعة؛ وسنة الدراسة والأداء المالي لشركات العينة. وبهذا توصي الدراسة بإعداد وتدريب المزيد من النساء للمناصب العليا ومعالجة الافتراضات غير الصحيحة حول كيفية استجابة السوق لترشيح نساء في مجالس الإدارة.

الكلمات المفتاحية: مجلس الإدارة؛ حوكمة الشركات؛ التنوع بين الجنسين؛ الأداء المالي للشركات؛ قيمة الشركة.