

# The Impact of Board Gender Diversity on Accounting Conservatism and the Cost of Debt: An Empirical Study on An Emerging Economy

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## Abstract

The current research aims to examine the effect of board gender diversity on the accounting conservatism and cost of debt in Egypt. It investigates the association between female directors and both accounting conservatism and cost of debt. It was hypothesized that the representation of women in board rooms significantly influence the accounting conservatism and financing cost. A sample of 81 Egyptian listed non-financial firms was used, and data were collected from their annual financial reports during 2014–2023 to be analyzed. Regression analysis was carried out to test the hypotheses. The results show that board gender diversity has a positive significant effect on accounting conservatism, but it will be negative in case of increasing the female representation to reach more than 17%. On the other side, there is a negative effect on cost of debt when the representation of female in board of directors increased more than 25%. This study presents evidence of the impact of board gender diversity on accounting conservatism and debt cost. There is no study – to the best of our knowledge – that has yet examined the association between female representation in board rooms and both accounting conservatism and cost of debt in Egypt for a recent period. Egyptian firms were recommended to increase the number of females in boards to reduce the cost of debt.

**KeyWords:** Board gender diversity, accounting conservatism, Cost of debt, Emerging economies, Egypt.

## تأثير التنوع بين الجنسين بمجلس الإدارة على التحفظ المحاسبي وتكلفة الاقتراض: دراسة تطبيقية في الاقتصاديات الناشئة

### ملخص البحث

يهدف البحث الحالي لاختبار تأثير التنوع بين الجنسين بمجلس الإدارة على التحفظ المحاسبي وتكلفة الاقتراض في مصر. كما تتحقق من الارتباط بين النساء المديرات في مجلس الإدارة وكلا من التحفظ المحاسبي وتكلفة الاقتراض. وتفترض الدراسة ان تمثيل المرأة في مجالس الإدارة سيؤثر بشكل قوي على التحفظ المحاسبي وتكلفة الاقتراض. وقد تم استخدام عينة مكونة من 81 شركة غير مالية مقيدة بالبورصة المصرية؛ وقد تم تجميع البيانات من التقارير المالية السنوية لتلك الشركات خلال الفترة من 2014-2023 لتحليلها. وقد تم اجراء تحليل الانحدار لاختبار فروض الدراسة.

تظهر النتائج ان التنوع بين الجنسين بمجلس الإدارة له تأثير إيجابي قوي على التحفظ المحاسبي لكنه سيصبح سلبي في حالة زيادة تمثيل المرأة بمجلس الإدارة الى أكثر من 17%. على الجانب الآخر يوجد تأثير سلبي على تكلفة الاقتراض عندما تزيد نسبة تمثيل المرأة بمجلس الإدارة عن 25%.

تقدم هذه الدراسة دليل على تأثير التنوع بين الجنسين بمجلس الإدارة على التحفظ المحاسبي وتكلفة الاقتراض. في حدود علم الباحثان - فإنه لا توجد دراسة بعد اختبرت الارتباط بين تمثيل المرأة بمجالس الإدارة وكلا من التحفظ المحاسبي وتكلفة الاقتراض حديثا في مصر. وقد أوصت الشركات بزيادة عدد النساء في مجالس ادارتها لتخفيض تكلفة الاقتراض.

**الكلمات المفتاحية:** التنوع بين الجنسين بمجلس الإدارة؛ التحفظ المحاسبي؛ تكلفة الاقتراض؛ الاقتصاديات الناشئة؛ مصر.

## **1-Introduction**

The board of directors (BD) has gained attention of academics and regulators in the last few years due to the increasing role of Corporate Governance (CG) in businesses. It can be considered as a main mechanism of CG. The main function of BD, according to agency theory, is controlling (Orazalin, 2020). The business environment crises have led to increased interest of researchers and regulatory bodies to improve the efficiency of the BD. The issuance of CG guides is one of the most prominent of these efforts. CG has been of great concern hence becoming a frequent feature in different corporate meetings (Subramanian, 2015). The company's BD represents a major element in these guides and can be considered as a key component of CG measures and assessments. Also, the BD as a CG mechanism may limit information asymmetry and mitigate management incentives that will reduce earnings management (Chi et al., 2015; Khalil & Ozkan, 2016), which in turn, enhance financial reporting quality (Pham et al., 2019; Orazalin, 2020).

Nowadays, there is a great interest in diversifying the BD around the world because of the direction toward promoting the role of women in the society. Gender diversity means the variance of characteristics that distinguish between male and female in businesses. It has been a great debate in organizations recently. Women's effective participation at all levels of decision-making in political, economic, and public life became necessary. Many countries directed attention toward the role of women in various areas. The importance of women's role in the society is clear especially in developed countries. The legislative bodies started to issue rules and laws to organize the work of females in vital positions in the country as well as in organizations.

Recently, one of the obvious issues that attract the attention of regulators in businesses is the gender and culture of the members of BD. Increased number of female managers at companies, in the past, clarifies their significant roles in the business field. The board gender diversity (BGD) concept has evolved and gained approval in businesses around the world. It is apparent that women have important role in the society. Some studies such as Adams and Ferreira (2009)

found that BGD enhances board effectiveness. Also, organizations can get debt costs at lower rates by diversifying their boards (Usman et al., 2019).

In last decades, the women representation in businesses field was very low globally. So, a global request for the presence of female in boards has been raised to improve corporate decision-making and governance (Nguyen et al. 2020). The governments in developed countries seek to enhance the role of women in the communities to improve the firm performance. They increased the women representation in corporate boards to be 40% in some countries. Several countries such as Australia, Canada and India made a flow of legislative amendments requiring presence of female directors in boards. Developed countries such as Sweden specified female representation in corporate boards of 25% (Terjesen & Sealy 2016). Also, in Norway, federal legislation requires 40% of women's representation in corporate boards with penalties for non-compliance and similar laws have been passed in the Netherlands (Mohsni et al., 2021). In addition, other countries have identified board gender quotas (i.e., Italy, France, or Spain) (Garcia-Blandon et al., 2022). On the other side, developing countries such as India and Turkey have been advocating for gender equality as well as improvement in CG (Mohsni et al., 2021). Consequently, female's participation in the business increased in developing countries (Khan et al., 2013).

In context of Egypt, it was suggested to increase the women representation in firm boards to improve the firm performance. The Financial Regulatory Authority has changed the regulations of woman presence in firms and issued the decision No. (109) in 2021 that indicates the women representation in board of listed companies is 25% or at least 2 members (FRA, 2021).

As a result of the change in board structure, research on BGD and its impact on CG and firm performance has evolved (Mohsni et al., 2021). The accounting literature sheds light on the relationship between BGD and the effectiveness of the BD. The presence of female in firms is essential to improve corporate financial performance and reputation (Bear et al., 2010). Also, board diversity may enhance the quality of board discussions and increase the ability of a board to provide better transparency (Carter et al., 2003). In general, women will be

more concerned with reducing negative business practices (Cumming et al., 2015). Thus, prior studies related to gender diversity examined the favorable features of female directors that may pay attention to firm performance and enhance board decision-making (Tanaka, 2014).

Prior research showed that females have various characteristics and skills compared to males (e.g., cautious, conservative) (Bear et al., 2010; Gul et al., 2011). It has been argued that female directors restrict managerial opportunism and will be better at doing so than their male counterparts (Sun et al., 2011). Moreover, extant research examined the influence of female directors on firm performance (e.g., Matsa & Miller, 2013; Brahma et al., 2021; Biduri et al., 2023; Wang et al., 2024), accounting quality (e.g., Arun et al., 2015; Lara et al., 2017), or tax avoidance (Garcia-Blandon et al., 2022) and found that the presence of females in boards positively affects CG (Ain et al., 2021) and firm performance (Wang et al., 2024).

Theoretically, female directors take out less debt and more generally make less risky financing and investment decisions (Faccio et al., 2016). Also, females in corporate boards are more conservative than their male counterparts are (Liu et al., 2016; Harris et al., 2019; Kao et al., 2020) and, therefore, they are less likely to allow managerial opportunism for fear of being accused (Zalata et al., 2022). The debate in literature regarding the apparent role of women in boards created a gap in research. Thus, current research strives to reduce the gap in literature by testing the role of women in board rooms and examining the effect of BGD on both accounting conservatism and debt costs.

Accounting conservatism is influential factor that improves financial reporting quality (Lim, 2011) and limits management's opportunistic behavior. Also, conservative accounting helps in reducing earnings management in firms (Khalifa et al., 2016), decreases the probability of overstatements by decreasing aggressive managerial estimates (Khan & Watts, 2009), and reduces the information asymmetry. Several studies found that women tend to be more risk averse than men (Croson & Gneezy, 2009; Adams and Funk, 2012; Abou-El-Sood, 2021), that means female directors may present more conservative strategies regarding the

use of debt. However, the approaches through which female directors can enhance the accounting conservatism and reduce the cost of debt are not clear to date. In addition, research on the impact of BGD on accounting conservatism and financing cost is still rare. Considering the diversity and scarcity of literature related to accounting conservatism and cost of debt in emerging economies, the research question could be formulated as whether there is an impact of BGD on accounting conservatism and the financing cost. Thus, this research focuses on the importance of female's presence in firm boards and its effect on accounting conservatism and cost of debt in Egyptian listed firms. Our objective is to determine whether female director is associated with enhanced accounting conservatism and less financing debt.

The current research is motivated by the interest of BGD around the world. Lack of gender diversity in boards can be considered as an issue of concern for regulators. So, the researchers test the effect of BGD on accounting conservatism and cost of debt in emerging economies like Egypt. The incentive for current study is that most of the research on BGD and its effects on conservatism and cost of debt has focused on developed countries, including the US (Adams and Ferreira, 2009; Benjamin & Biswas, 2019) and Europe (García & Herrero, 2021, Arun et al., 2015). Research on gender diversity in boards for companies in developing countries is still limited (Li & Chen, 2018).

The current study will add several contributions to the literature. First, it adds evidence to the results of previous research on BGD and financing cost to support the significant effect of female directors on the cost of debt. Also, it confirmed the role of women in board director to reduce the cost of debt. Second, it can be considered as one of the pioneer studies that examine the impact of BGD on both the accounting conservatism and financing cost in Egypt. Third, the study provided results that suggest the importance of increasing the women representation in board director to rational the accounting conservatism and decrease the debt costs.

The rest of the research is structured as follows. Section 2 reviews the prior literature and formulates the hypotheses. Section 3 explains the data, variables,

and the methodology. Discussion of results in Section 4, and last section concludes the research.

## **2-Literature Review and Hypotheses Development**

Recently, female representation in BD became a worldwide demand to enhance the firm performance. This representation can be considered as a factor related to CG to decrease information asymmetry. Gul et al. (2013) found that diversified BD has a negative relationship with information asymmetry. Prior literature on BGD, with respect to risk management decisions, presents additional evidence on difference between females and males, where women tend to be more risk averse and less risk-takers than men (Bedeir, 2024).

Prior research discussed the impact of BGD on firm performance (e.g., Rose 2007; Dezso & Ross 2012; García-Meca et al., 2015; Carter et al., 2010; Terjesen et al., 2014; Nguyen et al., 2020; Biduri et al., 2023) and decision making (Sarin & Wieland 2016, Chen et al., 2016). Contemporary research indicated that female directors have a positive effect on firm performance through achieving more independence on the board and achieving more profitability (e.g., Bennouri et al., 2018; Salloum et al., 2019). Terjesen et al. (2014) analyzed whether gender diversity enhances the independence and efficiency of BD and found that firms with more female directors have higher firm performance. Their results also suggested that external independent directors may not affect firm performance unless the board is gender diversified. In addition, they evidenced that female directors would enhance the effectiveness of BD.

Recent literature on CG sheds light on accounting conservatism because of its role in supporting firm governance and reducing information asymmetry between managers and stockholders (Bedeir, 2024). Conservatism is one of the most essential principals with a long record (Sayiq, 2022). Some studies showed that accounting conservatism can result in improving earnings quality by reducing earnings management (Anagnostopoulou et al., 2021). Srinidhi et al. (2011) indicated that BGD has a positive influence on earnings quality. Women have

been found more risk-averse, less aggressive, more worried, and more conscientious than males, and that show a conservative attitude (Sayiq, 2022).

Several studies discussed the relationship between BGD and accounting conservatism in developed and developing countries (Jasim et al. 2021; Sayiq, 2022; Alves, 2023; Muhammad et al., 2024; Bedeir, 2024). Sayiq (2022) examined how BGD affect accounting conservatism in United Kingdom. The findings of empirical analysis suggested that BGD is positively and significantly linked with accounting conservatism.

Similarly, a study by Alves (2023) investigated the impact of female's representation in board rooms on accounting conservatism in Europe, and whether their influence is more apparent when many female directors is reached. It documented a positive association between female directors and accounting conservatism, where companies that have more female directors in their board may report more conservative earnings compared to firms with fewer female directors. Also, Biduri et al. (2023) discussed the influence of gender diversity on accounting conservatism and showed that BGD had a positive effect on accounting conservatism and financial performance. In addition, Muhammad et al. (2024) provided results on BGD and accounting conservatism relationship in European countries by testing the mediating role of corporate social responsibility underlying this relationship and evidenced positive association between BGD and accounting conservatism and suggested that BGD promotes effective CG, which in turn, leads to higher conservatism in financial reporting.

On the other side, another research investigated the relationship between CG and the cost of debt (Schauten & Blom, 2006; Bradley & Chen, 2011; Ghouma et al., 2018). The theoretical framework illustrates how BD as CG mechanism affects the cost of debt. According to signaling theory, debt might signal positive signs to the markets which would potentially decrease the asymmetric information between firms and investors leading to a lower debt cost, which in turn, evaluates the firm's quality (Ghouma et al., 2018).



Moreover, several studies examined the association between BGD and cost of debt (Usman et al., 2019; Karavitis et al., 2021; Aksoy and Yilmaz, 2023). Ghouma et al. (2018) presented two main channels through which Canadian firms can have lower financing cost, the first channel is the reduction of the agency problems within the firm, and this can be achieved through BGD. The second channel is decreasing the information asymmetry between the firm and investors via female representation in boardrooms. Also, Usman et al. (2019) investigated the relationship between BGD and the cost of debt and found that the presence of female directors on the board reduces the cost of debt. In the same line of research, Aksoy and Yilmaz (2023) investigated the effects of board characteristics on the cost of debt for non-financial firms in Turkey and found that female directors in board rooms reduce the cost of debt.

In developing countries, Abdelzaher and Abdelzaher (2019) investigated the impact of BGD on firm performance in Egypt and found a positive impact of female board membership on firm value. Moreover, Jasim et al. (2021) examined the association between the BGD, the accounting conservatism and firm value in Iraqi firms. They hypothesized that BGD has a positive association with conservatism and firm value and reached results supporting this hypothesis.

## **2-1 Board Gender Diversity and Accounting Conservatism**

Current research on CG focuses on accounting conservatism due to its role in improving CG. In addition, conservative accounting methods are one of the more practical ways of preventing managerial opportunistic behavior and decreasing information asymmetry between managers and investors (Bedeir, 2024). Research illustrated that accounting conservatism can result in improving the information content of earnings and reducing earnings manipulation (Anagnostopoulou, 2021). Gender diversity as shown by female representation in the BD improves board meeting by allowing for a more diverse mindset, which in turn, increases the monitoring role (Bedeir, 2024).

There are a few studies which determine the association between BGD and accounting conservatism. However, some studies found that firms with strong

CG have improved accounting conservatism (Lara et al., 2022). The results of prior literature on BGD evidenced that women are more risk averse and conservative than men (Bedier, 2024). Also, accounting conservatism varies with the structure of the BD. Peni and Vahamaa (2010) found that women directors positively affect accounting quality measured by accounting conservatism and risk avoidance.

The importance of BGD in improving conservative accounting pay the attention to analyze the relationship between BGD and accounting conservatism. Although few empirical results on board gender diversity–conservatism relationship have been obtained, the results were mixed and inconsistent. Some studies suggested that BGD has a positive impact on accounting conservatism (e.g., Ahmed and Henry, 2012; Boussaid et al., 2015; Sayiq, 2022; Muhammad et al., 2024), while Lara et al. (2022) reveals a negative relationship and others found no effect (e.g., Liu et al., 2014; Ye et al., 2010). Considering the literature reviewed, second hypothesis has been proposed:

**H1.** Board gender diversity significantly affects accounting conservatism in Egyptian listed firms.

## **2-2 Board Gender Diversity and Cost of Debt**

BD can be considered as a main element of the CG structure, and an effective board will enhance the governance. Firms with gender diversified boards may reduce the risk faced by creditors and shareholders where well governed firms will protect stakeholders (Garcia-Blandon et al., 2022). Females have unique roles now in businesses around the world especially in board rooms. Executive women are slower than men at specific decisions, such as adopting aggressive strategies, so they are more likely to reduce the financial failure and enhance firm stability than executive men (Chen et al., 2019).

CG tends to be more concerned with female board directors, which can result in enhancing firm performance and achieving competitive advantage (Bedeir, 2024). Also, BGD is supported by agency theory and main resource dependence perspective theory, where the resource dependence perspective theory

supports the probability of increasing the information presented to managers by BGD because this diversity will make current information unique (Biduri et al., 2023). In addition, agency theory shows that board diversity may reduce information asymmetry, where female board representation decreases managerial opportunistic behavior and information asymmetry between lenders and borrowers and, consequently, creditors' perceptions about the probability of loan default (Karavitis et al., 2021; Kara et al., 2022), which in turn, affects the firm performance (Carter et al., 2010).

Following the amendments in legislative instruments, several developed countries and EU have a representation of female directors in board rooms of 40% and 25%, respectively (Terjesen & Sealy, 2016). While some developed countries have proposed women's board representation, some developing countries have made little progress. In Turkey, firms have been enabled to reduce agency costs through effective diversified board (Aksoy and Yilmaz, 2023). Also, Egyptian legislative bodies directed efforts toward empowering the woman in board rooms. So, this study tests the role of female directors concerning cost of debt in Egyptian listed firms.

Several studies explored the board diversity-performance relationship while the results were inconclusive. Some studies found positive impact of BGD on firm performance (Adams et Al., 2011; Post and Byron, 2015; Kim and Starks, 2016; Salloum et al., 2019; Brahma et al., 2021), whereas studies by Terjesen et al. (2016); Lim et al. (2019) and Wang et al. (2024) evidenced a significant negative effect. Ararat & Yurtoglu (2021); Kagzi & Guha (2018) and Carter et al. (2010) do not find any evidence of performance improvement associated with BGD.

Although, it has been explored how BGD might enhance firms' value (Abdelzaher & Abdelzaher, 2019; Mensah & Boachie, 2023). Contemporary research had mixed results of cost of debt and earnings quality based on gender differences. Various studies suggested that gender has impact on the earnings quality, where Srinidhi et al. (2011) and Orazalin (2020) found a positive impact,

while others found no significant differences due to gender unless critical mass is reached (Masi et al., 2021; García-Meca et al., 2022).

Extant research examined the effect of BGD on cost of debt while the results were inconclusive. Some studies found a relationship between female directors and cost of debt, where Francis et al. (2013) evidenced that female CFOs decrease the cost of loans, and Garcia & Herrero (2021) concluded a negative association between BGD and debt costs. While Kamil and Appiah (2022) found that more female directors in firms increase the cost of debt and others (Gracia-Blandon et al., 2022; Lara et al., 2017) found no significant association. The current research predicts that the debt cost will differ from male to female directors. It is expected that increasing representation of female in board rooms may reduce the cost of debt. Based on prior findings, the first hypothesis is developed:

**H2. Board gender diversity significantly affects the cost of debt in Egyptian listed firms.**

### 3- Research Methodology

#### 3-1 Data and Sample

The study's population comprises of firms listed in the Egyptian Stock Exchange from 2014 to 2023. However, financial firms such as banks and firms that have missing data have been excluded, resulting in a final sample size of 81 non-financial listed firms. According to the Global Industry Classification Standard (GICS), the following table illustrates the number of firm-year observations in seven different sectors during the study period.

**Table 1: The Distribution of the Sample**

GICS Sector Name	Companies	Freq.	Percent
Consumer Discretionary	14	139	17.42
Consumer Staples	19	188	23.56
Energy	1	10	1.25
Health Care	6	58	7.27
Industrials	15	150	18.80
Materials	13	127	15.91
Real Estate	13	126	15.79
Total	81	798	100.00

The data were collected from firms registered in Egyptian Stock Exchange, where the sample exemplifies 81 non-financial firms in different sectors. As shown in table (1), the Consumer Staples sector represents 19 firms of the total sample which is considered the largest sector, and the Industrials sector represents 15 firms. The Consumer Discretionary sector represents 14 firms, each, Materials and Real Estate sectors represent 13 firms. In addition, Health Care sector includes 6 firms, while the Energy sector can be considered as the smallest one representing 1 firm. Finally, the number of firms after excluding firms with incomplete data is 81 firms which represent the final sample of the study.

### 3-2 Variables and Measurements: Regression Models

To examine the effect of BGD on accounting conservatism and the cost of debt within the context of the Egyptian market, the researchers construct the following models:

#### Model 1:

$$\begin{aligned}
 MTB_{i,t} = & \beta_0 + \beta_1 GDR_{i,t} + \beta_2 GDR^2_{i,t} + \beta_3 Size_{i,t} + \beta_4 Lev_{i,t} \\
 & + \beta_5 Lev^2_{i,t} + \beta_6 FCF_{i,t} + \beta_7 ROA_{i,t} \\
 & + \beta_8 \text{Year Fixed Effects} + \varepsilon_{i,t}
 \end{aligned}$$

Where

MTB: Accounting Conservatism

GDR: Gender Diversity Ratio

Size: Firm Size

Lev: Leverage

FCFF: Free Cash Flow to the Firm

ROA: Return on Assets

$\varepsilon_{i,t}$ : estimated random error of company

**The Independent variable for model 1 & 2** is board gender diversity which is measured according to Wang (2024) by two approaches. The first measure is gender diversity (GDR) ratio

that was computed by dividing the number of females in board rooms by the total number of board directors. The other one is considering gender diversity (GD) as a dummy variable, 1 if the company has female in board director and 0 otherwise.

**The dependent variable for model 1** is the accounting conservatism. Market to Book (MTB) model was applied to measure it as in Beaver & Ryan (2000). It was calculated by dividing the market value of the company's shares by its book value.

**The dependent variable for model 2** is cost of debt (COD) which is defined in a study by Garcia & Herrero (2021) as interest expenses divided by average total debts.

#### Model 2:

$$\begin{aligned} \text{COD}_{i,t} = & \beta_0 + \beta_1 \text{GDR}_{i,t} + \beta_2 \text{GDR}_{i,t}^2 + \beta_3 \text{Std\_Size}_{i,t} + \beta_4 \text{Std\_Size}_{i,t}^2 \\ & + \beta_5 \text{Lev}_{i,t} + \beta_6 \text{FCFF}_{i,t} + \beta_7 \text{ROA}_{i,t} \\ & + \beta_8 \text{Year Fixed Effects} + \varepsilon_{i,t} \end{aligned}$$

Where

COD: Cost of Debt

GDR: Gender Diversity Ratio

Std\_Size: Firm Size

Lev: Leverage

FCFF: Free Cash Flow to the Firm

ROA: Return on Assets

$\varepsilon_{i,t}$ : estimated random error of company

The control variables are four variables that have been included in the regression models which are firm size, leverage, cash flow, and profitability. The size is measured by the natural logarithm of total assets (Khan & Watts, 2009). Leverage was chosen based on a study by Pandey et al. (2020) and computed by dividing total debt by total assets. Free cash flow ratio (FCFF) is measured by dividing free cash flow by total assets. Following Bédard et al. (2019), return on assets (ROA) to measure profitability is identified by the equation: operating earnings / total assets.

## 4-Empirical Results and Discussion

### 4-1 Descriptive Statistics

Table (2) presents the summary statistics for all variables included in the research models from 2014 to 2023.

**Table 2: Descriptive Statistics**

<b>Panel A: Descriptive Statistics for Continuous Variables</b>					
<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
MTB	798	2.348	2.52	-1.179	8.224
COD	798	.064	.08	0	.251
GDR	798	.109	.12	0	.44
Size	798	20.706	1.727	17.251	25.741
Lev	798	.516	.274	.005	1.247
FCFF	778	.018	.114	-.229	.296
ROA	790	.057	.113	-.194	.336

<b>Panel B: Frequencies for Dummy Variable</b>				
<b>Variable</b>	<b>Modality</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative</b>
GD	0	362	45.36	45.36
	1	436	54.64	100.00
		798	100.00	

This table reports all summary statistics based on the full sample of observations. MTB: is a measure of accounting conservatism. COD: is the cost of debt. GDR: is the gender diversity ratio, number of female to total number of the board; SIZE: is the firm size, the logarithm of total assets; Lev: is the firm's financial leverage, the ratio of total debt over total assets; FCFF: is the free cashflow ratio; ROA: is the return on assets, operating earnings over total assets; GD: is an indicator variable for board gender diversity, 1 if the firm has female in board director and 0 otherwise. Panel (A) reports descriptive statistics. Panel (B) reports frequencies.

Table (2) shows the summary statistics for all the study variables, presented under two panels: Panel (A) and Panel (B). Panel (A) includes the continuous variables, and Panel (B) includes the frequencies of the dummy variable. The continuous variables used in this research were identified at 3% to solve the effect of outliers.

Regarding accounting conservatism, the MTB ratio ranges from (-1.179) to (8.224). The maximum value of (8.224) suggests that some sampled firms are very conservative as they have a reduced net book value compared to their true economic value, meaning that they have unrecognized goodwill, making investors desire to trade firms' stocks at a premium to their book value, assuming market efficiency and that irrationality has a short-term impact. In contrast, the market moves towards equilibrium in the long run. Conversely, the minimum value of (-1.179) indicates that some firms in the Egyptian stock market suffer from recurring retained losses. Then, when the retained losses accumulate to the extent that they exceed a firm's total equity, the firm's equity base erodes and becomes negative. The large standard deviation (2.52) supports the wide variations among the sampled Egyptian firms regarding their degree of conservatism. However, firms that have an MTB ratio greater than one appear to dominate the sample, as evidenced by the positive value of the average MTB ratio of 2.348. This reflects that the average sampled firms are conservative.

Concerning the cost of debt, the sampled Egyptian firms reveal heterogeneity in terms of the interest paid on borrowed funds as documented by the large standard deviation (.08) compared to the mean (.064). The wide range between the minimum value (zero) and the maximum value (.251) emphasizes the variation among firm-year observations. The minimum value of zero reflects the potential existence of self-financed firms within the employed sample. At the same time, the maximum value of (.251) reflects that the highest interest rate imposed on the borrowing firms throughout the sampled period is 25.1%. Nonetheless, the average interest rate prevailing in the sample is 6.4%.

Regarding the gender diversity ratio (GDR), its average value over the sampled time horizon is (.109), which means that, on average, the Egyptian sampled



firms have 10.9% women on the board, reflecting the inequality in gender representation in the boardroom. Furthermore, some firms in the Egyptian environment have a 100% male representation and a zero female representation within the boardroom, as indicated by the minimum value. Even throughout the entire sampling period from 2014 to 2023, the maximum observed value stands at just .44, which is less than half. Considering Egypt's longstanding customs and traditions that have empowered the role of males at the expense of females in all spheres of life, it is deemed reasonable to have an average value of 10.9% of female in BD. The large standard deviation of (.12) indicates heterogeneity in terms of the female representation percentage among the sampled firms and over the sampled time span.

Concerning the firm-specific characteristics, firm size shows a standard deviation of (1.727), which is very small relative to the mean (20.706) due to applying the natural logarithm on the book value of total assets, which caused smoothing in firm size among the sampled Egyptian firms. Accordingly, firm size shows a small range between its minimum value (17.251) and its maximum value (25.741).

Regarding firm leverage (Lev), it has a mean value of (.516), which means that on average, the Egyptian sampled firms depend on a leverage ratio of 51.6%. The minimum value (.005) is very close to zero, which indicates the minor dependence of some Egyptian firms on debts. The maximum value (1.247) reflects that other firms depend heavily on debt in their capital structure. The moderately high standard deviation (.274) compared to the mean (.516) supports the reasonable heterogeneity among Egyptian firms in terms of their preference for debt over equity for financing assets and operations.

The free cashflow ratio (FCFF) has a wide range extending from (-.229) to (.296). The negative sign of the minimum value (-.229) reflects the failure of some sampled firms to generate sufficient positive cash flows to cover their cash outflows associated with operating processes and capital expenditure, which results in a deficit in FCFF. The maximum value (.296) accounts for around three-tenths of the total assets, which reveals that other firms in the sample are seriously

exposed to managers' discretionary activities as managers have control over hoarded cash of around three-tenths of total assets. Such an existence of higher levels of free cash flow might lead to expropriation by opportunistic managers for their own benefits and empire building. The large standard deviation (.114) aligns with the large range, suggesting large variations among the sampled firms. However, firms with a marginally positive free cash flow to limit the expropriation of excess cash appear to dominate the sample, as evidenced by the minimal positive value of the average FCF ratio of 1.8%. This mean value signifies that the sampled firms, on average, hoard a modest surplus of cash after funding their operating expenses and capital expenditures, which hinders managerial expropriation behavior.

In terms of profitability, the average return on assets (ROA) is (.057), which means that on average, the Egyptian sampled firms achieve returns on their assets of around 5.7%, indicating that for every Egyptian pound, the firms invest in their assets achieves on average .057 pounds. The minimum value is negative (-.194), indicating that some firms in the Egyptian environment suffer from a negative rate of return on their assets due to their inefficient utilization of their assets and resources. Conversely, the maximum value (.336) indicates that other firms achieve a positive rate of return on their assets, reaching 33.6%, as they optimally exploit their resources to maximize profitability. Consistent with the wide range, the standard deviation (.113) shows a large dispersion around the mean.

As seen in Panel (B) of Table (2), the frequencies of gender diversity (GD) within the sampled Egyptian firms reveal that 54.64% (n =436) of the sample have at least one female director in the board. In contrast, 45.36% (n =362) of the sample did not even appoint a single woman to their boards.

The descriptive statistics reveal relative heterogeneity within the sample. As such, the Egyptian stock market includes highly conservative firms compared to low conservative ones. Self-financed firms that pay no interest to lenders and have a leverage ratio close to zero compared to highly leveraged borrowing firms, whose cost of debt is 25.1%. Firms with zero female directors compared to

firms with 44% female directors on corporate boards. Firms with FCFE deficit compared to firms with FCFE surplus. Finally, profitable firms are compared to unprofitable firms that struggle to operate. However, it is worth noting that firm size stands out as the only highly homogenous variable in the sample. This homogeneity arises due to using the natural logarithm, which smoothed the dataset.

## 4-2 Two-Sample Test with Equal Variances

To examine whether the MTB and the COD vary across two different samples of diversified boards and undiversified boards, the two-sample t-test with equal variances is used to compare the means of two independent datasets.

**Table 3: Two-sample t test with equal variances**

	<b>Diversified-Boards (1)</b>	<b>Undiversified-Boards (2)</b>	<b>Diff. (3)</b>	<b>p value (4)</b>
MTB	2.51	2.154	-.356**	.047
COD	.07	0.058	-.012**	.035

This table reports the differences between the means for a sample of firms with diversified boards and a sample of firms with undiversified boards. Column 1 reports the means for the diversified boards' sample. Column 2 reports the means for the undiversified boards' sample. Column 3 reports the mean difference between diversified boards and undiversified boards, and column 4 reports the P-value for the difference. MTB is a measure of accounting conservatism. COD is the cost of debt. Levels of significance are presented as follows: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table (3) reveals a statistically significant difference in the average values of both MTB and COD between a sample of firms with diversified boards and a sample of undiversified boards, at a 5% significance level for each. This difference is economically significant, with the average of diversified boards having approximately 35.6% more MTB and 1.2% more COD relative to undiversified boards. These significant differences between the two means are greater than differences attributable to randomness or sampling error, indicating that the observed differences are more likely due to the statistical characteristics of two independent sets of observations.

### 4-3 Correlation Analysis Results

The Pearson Correlation matrix offers a preliminary understanding of the linear relationships among the current study variables. Correlation coefficients are employed to identify the direction and strength of the linear relationship between any variables included in this research. Furthermore, correlation coefficients are employed to detect potential multicollinearity among regressors within the same regression model, which may result in imprecise estimations.

**Table 4: Correlation Matrix (Pairwise Correlations)**

Variables	MTB	COD	GDR	Size	Lev	FCFF	ROA
MTB	1.000						
COD	-0.004 (0.921)	1.000					
GDR	0.000 (0.989)	0.057* (0.108)	1.000				
Size	0.002 (0.958)	0.190*** (0.000)	-0.017 (0.630)	1.000			
Lev	-0.031 (0.387)	0.112*** (0.001)	-0.049 (0.167)	0.263*** (0.000)	1.000		
FCFF	0.147*** (0.000)	-0.012 (0.736)	0.005 (0.890)	0.159*** (0.000)	-0.197*** (0.000)	1.000	
ROA	0.277*** (0.000)	-0.038 (0.286)	0.015 (0.664)	0.235*** (0.000)	-0.343*** (0.000)	0.554*** (0.000)	1.000

This table reports the Pearson correlations among variables of interest. Where, MTB is a measure of accounting conservatism. COD is the cost of debt. GDR is the gender diversity ratio. Size is the firm size. Lev is the firm's financial leverage. FCFF is the free cash flows ratio. ROA is the return on assets. Levels of significance are presented as follows: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The Pearson's correlation matrix reported in table (4) reveals that GDR has a significant positive correlation with COD, but insignificant correlation with MTB.

Regarding firm-specific characteristics, MTB has a significant positive association with FCFF and ROA. On the other hand, MTB has an insignificant linear association with size and LEV. Continuing with the firm-specific characteristics, COD has a significant positive association with Size and LEV. On the other hand, COD has an insignificant linear association with FCFF and ROA.

According to the detection of multicollinearity among the regressors in each model, the results indicate no potential for multicollinearity issues among all explanatory variables in the analysis. The highest observed correlation coefficient is 0.554, which is found between ROA and FCFF. Notably, Pearson's correlation coefficients do not account for non-linear relationships between variables. Therefore, it is essential to consider curvilinearity in the regression analysis.

#### 4-4 Regression Analysis

In order to investigate the effect of BGD on accounting conservatism and the cost of debt within the context of the Egyptian market, there are four regression models. The first two models examine the impact of BGD as a ratio (GDR) and as a dummy variable (GD) on accounting conservatism (MTB). The second two models test the impact of BGD as a ratio (GDR) and as a dummy variable (GD) on cost of debt (COD)

Based on the two employed proxies of BGD, the first two models concerning the impact on accounting conservatism (MTB) are developed as follows:

##### Model 1: the impact of GDR on the MTB

$$\begin{aligned} \text{MTB}_{i,t} = & \beta_0 + \beta_1 \text{GDR}_{i,t} + \beta_2 \text{GDR}^2_{i,t} + \beta_3 \text{Size}_{i,t} + \beta_4 \text{Lev}_{i,t} \\ & + \beta_5 \text{Lev}^2_{i,t} + \beta_6 \text{FCFF}_{i,t} + \beta_7 \text{ROA}_{i,t} \\ & + \beta_8 \text{Year Fixed Effects} + \varepsilon_{i,t} \end{aligned}$$

##### Model 2: the impact of GD on the MTB

$$\begin{aligned} \text{MTB}_{i,t} = & \beta_0 + \beta_1 \text{GD}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Lev}_{i,t} + \beta_4 \text{Lev}^2_{i,t} + \beta_5 \text{FCFF}_{i,t} \\ & + \beta_6 \text{ROA}_{i,t} + \varepsilon_{i,t} \end{aligned}$$

The definitions for all variables in previous equations were provided above.

Table (5) reports the results of the regression analysis by providing three main panels: Panel (A) reports the results of the OLS goodness of fit tests to assess the validity of the first two models concerning the impact on accounting conservatism (MTB), Panel (B) reports the fitted GLS regression results, and Panel (C) reports the turning points of the non-linear effects in the first two models.

The first two models are estimated using the Ordinary Least Squares (OLS) method and the Generalized Least Squares (GLS) method, considering any potential issues the OLS method may encounter. Before accepting the first two models as reliable models, some goodness of fit tests should be conducted to confirm that the statistical techniques applied in the current study best fit the sampled data. These tests are multicollinearity, heteroskedasticity, omitted variables, and autocorrelation.

Panel (A) of table (5) reveals no multicollinearity among models 1 and 2 regressors. Landau and Everitt (2004) and Field (2005) state that multicollinearity exists when the VIF of any independent variable exceeds 10. Therefore, there is no multicollinearity among the explanatory variables in the first two models concerning the impact on accounting conservatism (MTB). Furthermore, a serious heteroskedasticity issue exists in the first two models because their p-values of the Breusch–Pagan/Cook–Weisberg test for heteroskedasticity are less than 5% in models 1 and 2. Moreover, an autocorrelation issue exists in the first two models because their p-values of the Wooldridge test for autocorrelation in panel data are less than 5% in models 1 and 2. Relating to the Ramsey RESET test results for omitted variables, models 1 and 2 are well-specified because their p-values of the omitted variables test are greater than 5%.

Panel (B) of Table (5) reports the fitted GLS regression results of the first two models concerning the impact on accounting conservatism (MTB). The GLS method considers the econometric problems of heteroscedasticity and autocorrelation in the first two models. Additionally, the fitted models consider the potential non-linear relationships. The first two models are significant since their Prob > F is less than 0.05. According to the value of R-squared, the explanatory variables included in models 1 and 2 have explained around 52% and 51.4% of accounting conservatism as measured by the market-to-book ratio, respectively. The best-fitting model for the employed dataset according to the Akaike Information Criterion (AIC) as a criterion for model selection is model 2 because it has a lower AIC value than model 1.

Concerning BGD, the ratio proxy of diversity (GDR) shows an inverted-U-shaped non-linear effect on MTB, as reported in model 1 in Panel (B) of Table (5). The dummy proxy of diversity (GD) shows a significant positive linear effect on MTB, as reported in model 2 in Panel (B) of Table (5). The implications of the results of the two proxies of gender diversity reveal that firms that have at least one female director in board tend to be conservative in their accounting practices. However, as the number of female directors increases relative to the total number of directors, the effect on accounting conservatism changes at a certain point. This indicates the potential existence of an optimal level for the percentage of women in board.

From Panels (B) and (C) of Table (5), GDR reveals a curvilinear effect on conservatism as measured by the MTB ratio. As such, the results from model 1 indicate that the coefficient of GDR is significantly positive, and the coefficient of  $GDR^2$  is significantly negative. Accordingly, the pattern of the curvilinear effect of GDR on MTB takes the form of an inverted-U-shaped curve. In particular, the asymmetric effect of GDR on MTB includes one turning point, meaning that the direction of the effect changes once during the sampled period. Initially, when the GDR increases from zero to 17.1%, the conservative accounting practices increase alongside the increase in the percentage of female representation on the board until the GDR reaches 17.10%. Subsequently, when GDR exceeds 17.10%, conservatism starts to decline with a further increase in GDR. Figure (1) illustrates the curvilinear effect of GDR on conservatism as measured by the MTB ratio.

In terms of the firm-specific characteristics, leverage has a curvilinear effect on conservatism, as reported in the first two models. ROA has a significant positive linear effect on conservatism, as shown in models 1 and 2. Size and FCFE have insignificant effects on conservatism as measured by the MTB ratio in both models 1 and 2.

The asymmetric effect of leverage on conservatism takes the form of an inverted U-shaped curve. The coefficient of Lev is significantly positive, while the

coefficient of  $Lev^2$  is significantly negative. This means that the financial leverage has an initial enhancing effect on conservatism until the increase in leverage reaches a certain threshold (around 70.89% in model 1 and 72.19% in model 2), which is considered a turning point beyond which conservatism begins to deteriorate with the further increase in leverage.

A possible explanation for the significant positive linear effect of ROA on conservatism can be that firms with higher ROA may choose to be more conservative in their financial reporting to align with market expectations and maintain investor confidence, leading to a higher MTB ratio.

**Table 5: The Impact of Board Gender Diversity Proxies on Accounting Conservatism**

<b>Panel (A): The OLS Goodness of Fit Tests</b>		
	<b>(Model 1)</b>	<b>(Model 2)</b>
ROA	1.693	1.695
FCFF	1.446	1.446
Lev	1.339	1.338
Size	1.262	1.265
GDR	1.001	
GD		1.008
Mean VIF	1.348	1.351
Heteroskedasticity	Prob > chi2 = 0.0000	Prob > chi2 = 0.0000
Omitted variables	Prob > F = 0.1350	Prob > F = 0.1306
Autocorrelation	Prob > F = 0.0000	Prob > F = 0.0000
<b>Panel (B): The Fitted Generalized Least Squares Regression Results</b>		
<b>Variable</b>	<b>(Model 1)</b>	<b>(Model 2)</b>
GDR	3.76167*	--
GDR2	-11*	--
GD	--	0.29909*
Size	0.015	0.019
Lev	4.85498***	5.00070***
Lev2	-3.42437***	-3.46354***
FCFF	0.340	0.322
ROA	5.827***	5.926***
Number of obs	771	771

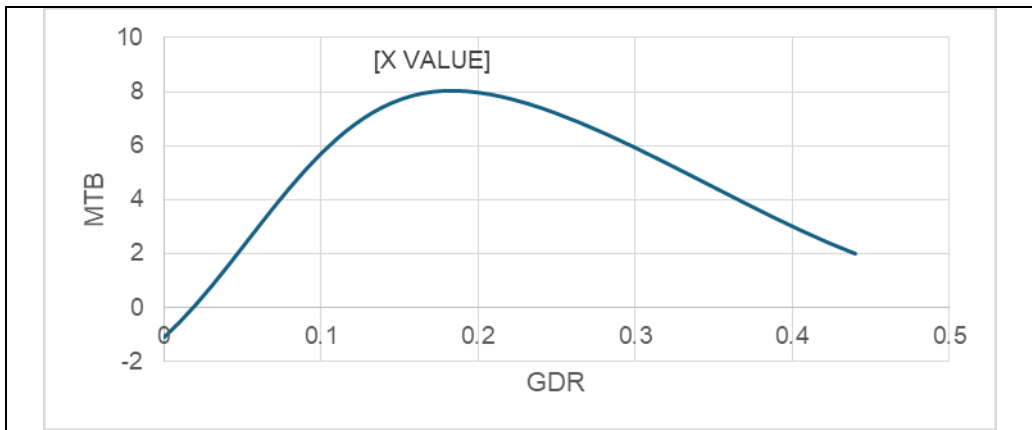


Prob > F	0.000	0.000
Year-Fixed-Effect	Yes	No
R2	0.52	0.514
Adjusted R2	0.509	0.51
AIC	3550.961	3539.747

**Panel (C): The Turning Points of Non-linear Effects in the MTB Models**

Variable	(Model 1)	(Model 2)
GDR	$\frac{\text{Coefficient of GDR}}{-(\text{Coefficient of GDR}^2) \cdot 2} = 0.170985$	
Lev	$\frac{\text{Coefficient of Lev}}{-(\text{Coefficient of Lev}^2) \cdot 2} = 0.7088865981$	$\frac{\text{Coefficient of Lev}}{-(\text{Coefficient of Lev}^2) \cdot 2} = 0.7219059113$

This table reports the results of the first two models (Model 1 and Model 2). MTB is a measure of accounting conservatism. GDR is the gender diversity ratio.  $GDR^2$  is the quadratic value of GDR. GD is an indicator variable for board gender diversity. Size is the firm size. Lev is the firm's financial leverage.  $Lev^2$  is the quadratic value of Lev. FCFF is the free cash low ratio. ROA is the return on assets. Panel (A) reports the results of the OLS goodness of fit tests for the first two models. Panel (B) reports the fitted GLS regression results for the first two models. Panel (C) reports the turning points of the non-linear effects in the first two models. In Models 1 and 2, the dependent variable is MTB. Model 1 reports the GLS regression results of the impact of GDR on MTB. Model 2 reports the GLS regression results of the impact of GD on MTB. Levels of significance are presented as follows: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Figure 1: The Quadratic Effect of GDR on Conservatism as Measured by the MTB Ratio**

Based on the two employed proxies of BGD, the second two models concerning the impact on COD are developed as follows:

**Model 3: the impact of GDR on the COD**

$$\begin{aligned} \text{COD}_{i,t} = & \beta_0 + \beta_1 \text{GDR}_{i,t} + \beta_2 \text{GDR}_{i,t}^2 + \beta_3 \text{Std\_Size}_{i,t} + \beta_4 \text{Std\_Size}_{i,t}^2 \\ & + \beta_5 \text{Lev}_{i,t} + \beta_6 \text{FCFF}_{i,t} + \beta_7 \text{ROA}_{i,t} \\ & + \beta_8 \text{Year Fixed Effects} + \varepsilon_{i,t} \end{aligned}$$

**Model 4: the impact of GD on the COD**

$$\begin{aligned} \text{COD}_{i,t} = & \beta_0 + \beta_1 \text{GD}_{i,t} + \beta_2 \text{Std\_Size}_{i,t} + \beta_3 \text{Std\_Size}_{i,t}^2 + \beta_4 \text{Lev}_{i,t} \\ & + \beta_5 \text{FCFF}_{i,t} + \beta_6 \text{ROA}_{i,t} + \beta_7 \text{Year Fixed Effects} + \varepsilon_{i,t} \end{aligned}$$

The definitions for all variables in previous equations were provided above.

Table (6) reports the results of the regression analysis by providing three main panels: Panel (A) reports the results of the OLS goodness of fit tests to assess the validity of the second two models concerning the impact on the cost of debt, Panel (B) reports the fitted GLS regression results, and Panel (C) reports the turning points of the non-linear effects in models 3 and 4.

The second two models are estimated using the Ordinary Least Squares (OLS) method and the Generalized Least Squares (GLS) method, considering any potential issues the OLS method may encounter. Before accepting the second two models as reliable models, some goodness of fit tests should be conducted to confirm that the statistical techniques applied in the current study best fit the sampled data. These tests are multicollinearity, heteroskedasticity, omitted variables, and autocorrelation.

Panel (A) of Table (6) reveals no multicollinearity among models 3 and 4 regressors. Landau and Everitt (2004) and Field (2005) state that multicollinearity exists when the VIF of any independent variable exceeds 10. Therefore, there is no multicollinearity among the explanatory variables in the second two models concerning the impact on the cost of debt. Furthermore, there is no serious heteroskedasticity issue in the second two models because their p-values of the

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity are greater than 5% in models 3 and 4. Moreover, an autocorrelation issue exists in the second two models because their p-values of the Wooldridge test for autocorrelation in panel data are less than 5% in models 3 and 4. Regarding the Ramsey RESET test results for omitted variables, models 3 and 4 are mis specified because their p-values of the omitted variables test are less than 5%.

Panel (B) of Table (6) reports the fitted GLS regression results of the second two models concerning the impact on COD. The GLS method considers the econometric problems of autocorrelation and model misspecification in the second two models. Additionally, the fitted models consider the potential non-linear relationships. The second two models are significant since their Prob > F is less than 0.05. According to the R-squared value, the explanatory variables included in models 3 and 4 explain around 42.2% and 42.1% of the cost of debt, respectively.

Based on the Akaike information criterion (AIC) as a criterion for model selection, both models 3 and 4 are indifferent in terms of their ability to fit the dataset because their AIC values are almost equal. These very close AIC values indicate that both models provide a similar level of fit to the dataset, and there is no clear advantage of one model over the other in terms of goodness of fit and complexity.

Concerning BGD, the ratio proxy of diversity (GDR) shows an inverted-U-shaped non-linear effect on COD, as reported in model 3 in Panel (B) of Table (6). The dummy proxy of diversity (GD) shows a significant positive linear effect on COD, as reported in Model 4 in Panel (B) of table (6). The implications of the results of the two proxies of gender diversity reveal that the firms that have at least one-woman director in board tend to pay higher interest on debts. However, as the number of female directors increases relative to the total number of directors, the effect on COD changes at a certain point. This indicates the potential existence of an optimal level for the percentage of females in board.

From Panels (B) and (C) of Table (6), GDR reveals a curvilinear effect on COD. As such, the results from Model 3 indicate that the coefficient of GDR is significantly positive, and the coefficient of  $GDR^2$  is significantly negative. Accordingly, the pattern of the curvilinear effect of GDR on COD takes the form of an inverted-U-shaped curve. In particular, the asymmetric effect of GDR on COD includes one turning point, meaning that the direction of the effect changes once during the sampled period. Initially, when the GDR increases from zero to 26.78%, the COD increases alongside the increase in the percentage of female representation on the board until the GDR reaches 26.78%. Subsequently, when GDR exceeds 26.78%, COD starts to decline with a further increase in GDR. Figure (2) illustrates the curvilinear effect of GDR on COD.

In terms of the firm-specific characteristics, firm size has a curvilinear effect on COD, as reported in the second two models. Leverage has a significant positive linear effect on COD, as shown in models 3 and 4. ROA and FCFF have insignificant COD effects in models 3 and 4. The asymmetric effect of size on COD is an inverted U-shaped curve. As the coefficient of *std\_Size* is significantly positive, while the coefficient of  $std\_Size^2$  is significantly negative. This means that the firm size has an initial amplifying effect on COD until the increase in size reaches a certain threshold (approximately around 22 of the log-transformed total assets), which is considered a turning point beyond which COD begins to decline with the further increase in size.

A possible explanation for the significant positive linear effect of financial leverage on the cost of debt can be that the increased reliance on higher leverage increases the overall risk profile of the firm. Creditors and investors perceive higher leverage as a sign of increased financial risk due to higher debt obligations and interest payments. This heightened risk perception often leads creditors to demand a higher return on their investment, resulting in a higher cost of debt for the firm.

**Table 6: The Impact of Board Gender Diversity Proxies on Cost of Debt**

<b>Panel (A): The OLS Goodness of Fit Tests</b>		
	<b>(Model 3)</b>	<b>(Model 4)</b>
ROA	1.693	1.695
FCFF	1.446	1.446
Lev	1.339	1.338
Size	1.262	1.265
GDR	1.001	
GD		1.008
Mean VIF	1.348	1.351
Heteroskedasticity	Prob > chi2 = 0.5121	Prob > chi2 = 0.4601
Omitted variables	Prob > F = 0.0000	Prob > F = 0.0000
Autocorrelation	Prob > F = 0.0016	Prob > F = 0.0017

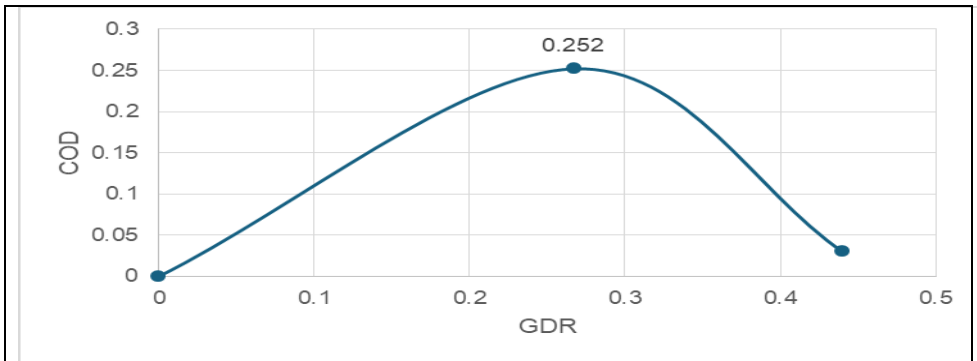
  

<b>Panel (B): The Fitted Generalized Least Squares Regression Results</b>		
<b>Variable</b>	<b>(Model 3)</b>	<b>(Model 4)</b>
GDR	0.17444**	--
GDR2	-0.32574*	--
GD	--	0.01811***
std_Size	0.01436***	0.01393***
std_Size2	-0.00833***	-0.00838***
Lev	0.04002***	0.04014***
FCFF	0.011	0.010
ROA	-0.041	-0.042
Year Fixed Effect	Yes	Yes
Number of obs	771	771
Prob > F	0.000	0.000
R2	0.422	0.421
Adjusted R2	0.4095	0.409
AIC	-1703.813	-1704.114

<b>Panel (C): The Turning Points of Non-linear Effects in the COD Models</b>		
<b>Variable</b>	<b>(Model 3)</b>	<b>(Model 4)</b>
GDR	$\frac{\text{Coefficient of GDR}}{-(\text{Coefficient of GDR}^2)+2} = 0.26775956$	
Size	$\frac{\text{Coefficient of Std\_Size}}{-(\text{Coefficient of Std\_Size}^2)+2} = 0.861944778$ Original Turning Point of Size = (0.8619*1.727) + 20.706 = 22.19457863	$\frac{\text{Coefficient of Std\_Size}}{-(\text{Coefficient of Std\_Size}^2)+2} = 0.8311455847$ Original Turning Point of Size = (0.83115*1.727) + 20.706 = 22.14138842

This table reports the results of the second two models (Model 3 and Model 4). Where COD is the cost of debt. GDR is the gender diversity ratio.  $GDR^2$  is the quadratic value of GDR. GD is an indicator variable for board gender diversity. Std\_Size is the standardized value of firm size.  $Std\_Size^2$  is the quadratic value of Std\_Size. Size is the firm size. Lev is the firm's financial leverage. FCFF is the free cashflow ratio. ROA is the return on assets. Panel (A) reports the OLS goodness of fit test results for the second two models. Panel (B) reports the fitted GLS regression results for the second two models. Panel (C) reports the turning points of the non-linear effects in the second two models. In Models 3 and 4, the dependent variable is COD. Model 3 reports the GLS regression results of the impact of GDR on COD. Model 4 reports the GLS regression results of the impact of GD on COD. The standardized value of size is transformed into its original value using the following equation: (Std\_Size \* Std. Dev. of Size) + Mean of Size. Levels of significance are presented as follows: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Figure 2: The Quadratic Effect of GDR on COD**

The implications of the results of the two proxies of gender diversity reveal that the firms that have at least one female director on board tend to pay higher interest on debts. However, as the number of female directors increases relative to the total number of directors, the effect on COD changes at a certain point. This indicates the potential existence of an optimal level for the percentage of women in board.

The results of this research indicate that BGD has a positive impact on accounting conservatism until the representation of women is less than 17% and the effect will be negative when the representation increased more than 17%. On contrary to prior studies that found a positive effect of female directors on accounting conservatism (Srinidhi et al., 2011; Francis et al., 2015; Sayiq, 2022; Muhammad et al., 2024), this study found that increasing female directors in firms will reduce the accounting conservatism. This finding is consistent with Lara et al. (2022) that found a negative relationship. Also, BGD has a negative effect on cost of debt, where increasing female representation in board rooms to more than 25% will decrease the financing cost. This finding is consistent with Aksoy and Yilmaz (2023) and Francis et al. (2013) while inconsistent with a study by Kamil and Appiah (2022) that found a positive association between BGD and cost of debt.

As a result, the hypotheses of the study are accepted, where first and second hypotheses propose a significant effect of BGD on accounting conservatism and cost of debt since our results support the research hypotheses.

## 5- Conclusion

The research adds valuable contributions to previous studies in several ways. It was unique attempt to examine the presence of female directors in non-financial firms listed in the Egyptian stock Exchange. Also, the study presents value to the literature on BGD that have been found to be significantly affect accounting conservatism and cost of debt in developed countries and still unclear in developing countries such as Egypt. The results showed that BGD has a positive impact on accounting conservatism until the female representation in board rooms reaches to 17%, while it has a negative impact on cost of debt when the women presence in board rooms exceeds 25%.

The results contribute to accounting research by presenting an understanding of the role of BGD in emerging economies. In addition, another contribution is evidencing the importance of the presence of females in board rooms of Egyptian firms.

The current study recommends the regulatory bodies in Egypt to increase women representation in board rooms to be more than 25% because this will reduce the financing cost in firms. Also, the increased representation of women in board rooms will rationale the accounting conservatism.

However, there are some limitations, where the study is applied in Egypt as a developing country that may not explain the situation in other countries. Also, the sample was small because it includes only 81 non-financial listed firms, that can be considered insufficient to generalize the results. Another limitation is the limited period which is only 10 years starting from 2014 until 2023.

Future research can investigate the impact of BGD in different economies. Also, sample can be increased by including financial firms to be bigger sample. Another research can consider various factors that may influence accounting conservatism and the cost of debt. Moreover, future research can be conducted to examine other effects of BGD.

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