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Earnings Quality and Price Informativeness: The Moderator Role of Gender Diversity

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A B S T R A C T

Women's representation on corporate boards has recently drawn increasing attention. This study aims to investigate the moderator role of females on the board of directors on the relationship between earnings quality (EQ) and stock price informativeness. This research uses secondary data obtained from the Sahra database with the span of 158 active firms on the Tehran Stock Exchange from 2017 to 2021. Findings indicated that the presence of female directors on the board had a favorable impact on the correlation between EQ and pricing informativeness. That is, firms with more female board members have a greater association between EQ and stock price informativeness. The practical application of this research relates to female CEOs' monitoring roles, thereby enhancing the quality of financial reporting

KEY WORDS: *female monitoring role, earnings quality, gender diversity, stock price informativeness*

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Introduction

Female roles in board positions in business entities have recently gained considerable attention (Beaman et al., 2009; Nielsen c Huse, 2010). Daily et al. (1999) found that the percentage of female independent executives has increased significantly over the past 10 years. Empirical research on the status of female executives in the top 500 companies globally in 1987 and 1996 has proven that the "glass roof" phenomenon for women gradually disappeared in the workplace. Moreover, public media focuses considerably on female managers (Lee & James, 2007).

However, the extent of females occupying top management positions has remained exceptionally low in most countries, even though it has been expanding in the US and some European countries. A few governments, such as those of Sweden and Norway, have set guidelines for the gender composition of the board of private sector businesses (Nielsen & Huse, 2010).

The presence of women on the board is debatable from the social and economic perspectives: socially, women have equal opportunities with men in managerial positions (Van der Walt & Ingley, 2003; Issa et al., 2019); economically, organizations should select the right people for their managerial positions without considering gender. Gender discrimination will prevent organizations from using human resources effectively (Singh et al., 2001). Studies have shown that women have valuable skills that lead to improved corporate performance, thereby having a positive effect on corporate value (Campbell & Mingyuz-Vera 2008; Adams & Ferreira, 2009; Simionescu et al., 2021).

The literature on gender differences has indicated that women and men behave differently in terms of leadership (Eagly & Johannesen, 2001; Eagly & Chin, 2010; Reddy et al., 2017; Hedija & Němec, 2021). Gender disparities in leadership should be understood in terms of agentic and community aspects (Eagly & Carli., 2003; Barbuto & Gifford, 2010).

Compared with women, men are more likely to be forceful, ambitious, aggressive, autonomous, self-confident, brave, and competitive. Accordingly, agentic behavior refers to goal attainment and task performance (Eagly & Johannesen, 2001; Weigold & Robitschek, 2011). Examples of agentic behavior in the workplace are speaking assertively, fighting for attention, influencing others, and giving problem-focused suggestions (Nielsen & Huse, 2010).

Communal behavior, which is more strongly associated with women than men, includes being affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturing, and gentle. Examples of community behavior in the workplace are speaking tentatively, not calling attention to oneself, accepting others' viewpoints, supporting and comforting others, and helping in the resolution of relationship and interpersonal problems (Eagly & Johannesen, 2001; Nielsen & Huse, 2010). Compared with male leaders, women leaders are more democratic and participatory and less autocratic and directive (Barbuto, & Gifford, 2010; Reddy et al., 2017). Eagly and Carli (2003) explained that female leaders are less hierarchical, more cooperative and collaborative, and more concerned with increasing the self-worth of others. Avolio et al., (2017) fond that executive females recognize development strategies such as, networking, support of the leader, search for a challenging work, making important decisions with determination, the "hard work", and the passion for what they do, which would allow them to grow professionally during their personal and work experience.

Adams and Ferreira (2009) empirically found that the participation of females in top positions as board directors significantly improves the performance of companies' businesses. Moreover, Kamath (2022) fond that gender diversity and independent female directors positively affect firm performance through capital expended efficiency. The reason is that a markedly diverse board of directors can make choices based on the assessment of more options compared with a more homogenous board. The inclusion of women in decision-making teams would bring new ideas so that companies' management decision-making systems will be substantially accurate and efficient, leading to enhanced company performance (Hutton et al., 2009).

Although the role of females in top positions of companies has received significant attention in developed countries, developing countries, such as Iran, have focused (deservedly) on women's contributions to the board of directors of business entities. For example, data on the Iranian stock market exchange show that the highest presence of women on the board of directors is in the pharmaceutical industry, with about 24 women out of the 182 board positions (Majdzadeh et al., 2019). The current study attempts to contribute to the body of knowledge by investigating the influence of board gender diversity on the information content of the stock price of Iranian firms listed on the Tehran Stock Exchange (TSE).

This paper is trying to answer the following question: Does gender diversity has a positive moderator role on the relationship between earning quality and stock price informativeness?

By investigating the impact of gender diversity on the relationship between earnings quality (EQ) and informative content of stock prices, this study adds to the growing body of evidence that link gender diversity to the quality of financial information. The importance of this research comes from the two streams. First, the accounting stream examines various governance mechanisms that are highly effective in ensuring financial reporting integrity. Second, the governance stream investigates whether or not the presence of women on boards of directors has an impact on the effectiveness of corporate governance.

A strict non-experimental methodology has been applied over a sample of public traded companies in the Tehran stock exchange to answer the research question.

The remainder of the paper is organized as follows: in the second section, the theoretical background of gender diversity, corporate governance and stock price informativeness are presented. In the third section, the research methodology has been presented. In the fourth section, results and discussion has been discussed and finally, conclusions are presented in the last section

Gender Diversity, Corporate Governance, and Informative Content of Stock Price

Traditional theories of board governance, such as agency theory (Fama, 1970; Jensen & Meckling, 1976) and resource dependence perspective (Pfeffer & Salancik, 1978), do not provide substantial insights into how women contribute to board performance. The current research recognizes the limitations of traditional governance theories in understanding women's roles and contributions on corporate boards and discusses gender differences theory (Eagly & Schmidt, 2001) and group effectiveness theory (Williams & Reilly, 1998) to explain the influence of gender diversity on the information content of stock price.

Bilimoria (2006) explained that women are highly regarded as board members because of their capacity to contribute strategic insights and foster productive dialogue. The presentation of different perspectives in a productive dialogue can lead to the presentation of additional options and

high-quality decision-making on organizational plans and practices. Furthermore, women's special role on boards is frequently reflected in their high sensitivity and cooperative management style (Hedija & Němec, 2021). These abilities could lead to females on the board of directors taking a markedly active role in strategic decisions affecting company performance and value.

Several recent studies (Marinova et al., 2016; 2020; Hedija & Němec, 2021) have examined the economic results of companies with female executives on their boards. The main argument for providing a positive relationship between women on boards and company value is related to two main functions of boards: monitoring and providing access to company resources (Hillman & Dalziel, 2003; Adams & Ferreira, 2009; Lara et al., 2017).

Females on boards of directors can improve the monitoring role of these boards for a variety of reasons. First, females are unique human capital resources that bring a variety of skills and experiences, leading to an effective corporate governance process (Hillman & Dalziel, 2003; Terjesen et al., 2009). Second, women improve the decision-making process and leadership style of board directors (Matsa & Miller, 2013). Nielson and Huse (2010) found that the proportion of female directors on boards is linked to strategic control, thereby leading to a facilitation of decision-making processes and low conflict levels. Lastly, female CEOs demand audits extensively (Gull et al., 2018), improve experiences and perceptions that lead to enhanced quality of board decisions while improving the legitimacy of companies (Hillman et al., 2007), and assist in improving earnings and quality of accounting numbers.

Monitoring the role of females on boards can influence the quality of financial information disclosed by accounting systems (Ye & Rezayee, 2010; Aribi et al., 2018; Arun et al., 2015; Gull, 2018; Dobija et al., 2022). Gull (2018) examined the link between gender diversity and the quality of financial statements, emphasizing the importance of female directors' qualities in improving the quality of financial statements. Garcia et al. (2017) found that gender diversity on boards of directors has a positive impact on conservatism and the quality of bank earnings. Ud Din et al. (2021) empirically revealed that female chairpersons' accounting expertise boosts the quality of financial reporting more than their male colleagues.

According to the efficient market hypothesis (Fama, 1970), the quality of financial information refers to the extent of firms' specific and general

information available in the market that will be reflected in stock prices. The reflection of company-specific information in stock prices is correlated to high-quality financial information, which refers to the information content of stock prices (Morck, & Yu, 2000). Therefore, gender diversity can improve the information content of stock prices by increasing the quality of financial information through oversight and also monitoring of managers, thereby making them more transparent and also developing and facilitating access to firms' specific information (Gao, 2018; Gull, 2018).

Research Methodology

Data Collection and Sample

To test the research hypotheses, data from the Iranian database Sahra was used. The current study's statistical population includes all companies listed on TSE before 2017. Given that this research's statistical population comprises all companies registered in TSE, the sample is limited to those that meet the following criteria. First, the date of company admittance to TSE is before the fiscal year 2017. Second, all investing and banking organizations were omitted from the sample owing to their differing structures. Lastly, companies' financial periods should expire on March 20 (Iranian calendar). On the bases of these criteria, the final sample includes 158 out of 470 active enterprises in TSE from 2017 to 2021.

Research Variables

To investigate the moderator role of females on boards of directors on the relationship between EQ and informative content of stock price, we followed previous studies (Nielsen and Huse, 2010; Jia & Zhang, 2013; Issa et al., 2019; Mintah & Schadewitz, 2019) and used a dummy variable for the presence of female directors on boards, with a value of "1" for boards with females and "0" otherwise.

By using the Dechow and Dichev (2002) model, quality of accruals (QA) was utilized as an inverse measure of EQ and EQ as an independent variable. QA refers to the liquidity's degree of accrual income. That is, the higher the degree of liquidity of accruals is associated, the higher the QA.

QA is calculated as follows based on the Dechow and Dichev model:

$$\frac{TCA_{j,t}}{Assets_{j,t}} = \alpha_0 + \beta_1 \frac{CFO_{j,t-1}}{Assets_{j,t}} + \beta_2 \frac{CFO_{j,t}}{Assets_{j,t}} + \beta_3 \frac{CFO_{j,t+1}}{Assets_{j,t}} + \beta_4 \frac{\Delta REV_{j,t}}{Assets_{j,t}} + \beta_5 \frac{PPE_{j,t}}{Assets_{j,t}} + \varepsilon \quad (1)$$

where
TCA = total accruals of firm j in year t, which should be calculated from the following equation:

$$TCA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDebt_{j,t} - Depn_{j,t}, \qquad (2)$$

where
$\Delta CA_{j,t}$ = Changes of current assets of firm j in year t
$\Delta CL_{j,t}$ = Changes of current liabilities of firm j in year t
$\Delta Cash_{j,t}$ = Changes of cash of firm j in year t
$\Delta STDebt$ = Changes of short-term liabilities of firm j in year t
$Depn_{j,t}$ = depreciation expense of firm j in year t

$CFO_{j,t-1}$ = operation cash flow of firm j in year t − 1
$CFO_{j,t}$ = operation cash flow of firm j in year t
$CFO_{j,t+1}$ = operation cash flow of firm j in year t + 1
$\Delta REV_{j,t}$ = changes in firm's revenue in year t
$PPE_{j,t}$ = property, plant, and equipment of firm j in year t
ε = regression error.

According to the Dechow and Dichev (2002) model, regression errors are the inverse measure of EQ. That is, the greater the error of regression, the lower the QA and, consequently, the lower the quality of earnings. The usefulness of applying the Dechow and Dichev model to measure the EQ can be illustrated in two ways. First, this measure is highly correlated to firm-specific characteristics, such as operating cycle, sales, cash flows, and firm size. The monitoring role of females on boards would affect firm-level specific data through the corporate governance process (Dechow & Dichev; 2002; Hillman & Dalziel, 2003; Hillman et al., 2007; Terjesen et al., 2009). Second, the Dechow and Dichev QA model is highly associated with earnings persistence (Dechow & Dichev; 2002; Shoaib & Siddiqui, 2022), which is one of the most important determinants of the information content of stock prices (Aveh & Awunyo-Vitor, 2017).

Following the literature (Chan, & Hameed, 2006; An & Zhang, 2013; Todea & Buglea, 2017; Todea, 2018), stock price synchronicity was applied

to measure the information content of stock prices. Stock price synchronization occurs when stock price fluctuations are greater than stock return fluctuations. The lower the stock price synchronization, the more informative the stock prices, so that stock price synchronicity can be used as an inverse measure of stock price informativeness. These studies have indicated that synchronicity measures the extent to which information on business fundamentals is capitalized into stock prices. Empirical findings (Zhou, J., 2008; Chan et al. 2006; An & Zhang, 2013) have supported the use of stock price synchronization as an inverse measure of the timely and correct absorption of firm-specific information into stock prices.

Mork et al.'s (2000) model was used to calculate stock price synchronicity:

$$r_{j.t} = \sigma_j + \beta_1 r_{m.t} + \beta_2 r_{k.t} + \epsilon_{j.t} , \qquad (3)$$

Where;
$r_{j.t}$ = stock's return of firm j in year t
$r_{m.t}$ = average of TSE returns in year t
$r_{k.t}$ = return of K's industry in year t
$\epsilon_{j.t}$ = regression residuals

From the preceding model, R^2, which is the model's adjusted coefficient of determination, is extracted and stock price synchronicity is calculated as follows:

$$SYNCH_{j.t} = ln \left(\frac{R_{i,t}^2}{1 - R_{i,t}^2} \right), \qquad (4)$$

Where;
R^2 = coefficient of determination of the regression model of the time series of Equation 3. Note that Model 3 was applied separately for all sample industries. Thereafter, the adjusted coefficient of determination obtained from the regression was inputted in Model 4 for each company according to the relevant industry. The result was a time series and the use of the ordinary least squares method to test the hypotheses.

Several control variables were applied to the regression models to mitigate the probability of unobserved variables. Following Gao (2018), Shoaib and Siddiqui (2022), and Agyemang et al. (2019), control variables

include the return-on-equity (ROE) ratio, leverage ratio, market-to-book ratio, and the ratio of outside directors to executive directors of the board.

Methods of analysis

The following statistical models were adapted and developed by the hypotheses developed in this study to investigate the moderator role of women's leadership on the relationship between EQ and stock price informativeness. Although Models 1 and 2 investigated the direct relationship between EQ and the presence of women on board directors as independent variables and stock price informativeness as a dependent variable, Model 3 analyzed the moderator role of females in the board directors on the relationship between EQ and stock price informativeness.

Model 1)

$$SYNCH_{it} = \alpha_0 + \beta_1 FIDIR_{it} + \beta_2 ROE_{it} + \beta_3 LEV_{it} + \beta_4 MtoB_{it} + \beta_5 IDIR_{it} + \varepsilon$$

Model 2)

$$SYNCH_{it} = \alpha_0 + \beta_1 EQ_{it} + \beta_2 ROE_{it} + \beta_3 LEV_{it} + \beta_4 MtoB_{it} + \beta_5 IDIR_{it} + \varepsilon$$

Model 3)

$$SYNCH_{it} = \alpha_0 + \beta_1 FIDIR_{it} + \beta_2 EQ_{it} + \beta_3 (FIDIR \times EQ)_{it} + \beta_2 ROE_{it} + \beta_3 LEV_{it} + \beta_4 MtoB_{it} + \beta_5 IDIR_{it} + \varepsilon$$

Panel data analysis includes the fixed effect GLS estimation, which was applied to the models. Several advantages of panel data evaluation have motivated researchers to apply it (Gujarati, 2003; Connell, 2007). These advantages are as follows. First, by using the right panel estimation and modeling, researchers can control for unobservable firm-precise outcomes or time-invariant overlooked variables. Second, the performance of econometric estimates may improve because each dimension of the facts, specifically cross-section and time-series dimensions, should be included in panel data. This situation may prompt researchers to have a wide range of data points, which may increase the degree of freedom and decrease collinearity among explanatory variables. Lastly, individual differences between the cross-section and time differences between the period were considered by using panel data and including dummy variables in the model specification.

Pre-Estimation Analysis

Assumptions of linear regression analysis, known as the Gauss–Markov condition, should be tested before running the regression estimations to run an unbiased regression model (Hair et al. 2010). These assumptions include no collinearity (or no multicollinearity), constant variance (homoscedasticity), and no autocorrelation (or no serial correlation).

The correlation matrix was used to detect the degree of multicollinearity. Table 1 shows the results of correlation analysis for this study's independent variables. The results indicate no multicollinearity problem among the independent variables. Multicollinearity arises when the correlation among independent variables is over 0.9 (Hair et al. 2010). Table 1 also shows that the highest correlation (i.e., 0.60) is between ROE and MtoB.

Table 4. Correlation Matrix of Independent Variables

Correlation Probability	FIDIR	EQ	ROE	LEV	MtoB	IDIR
FIDIR	1.00					

EQ	0.41	1.00				
	(0.00)	-----				
ROE	0.45	0.60	1.00			
	(0.00)	(0.02)	-----			
LEV	0.10	−0.21	0.55	1.00		
	(0.01)	(0.00)	(0.00)	-----		
MtoB	0.05	0.59	0.62	−0.60	1.00	
	(0.09)	(0.00)	(0.00)	(0.00)	-----	
IDIR	0.06	0.48	0.36	−0.29	0.53	1.00
	(0.1)	(0.00)	(0.00)	(0.00)	(0.02)	

Note: P-values are given in parentheses.

FIDIR = percentage of females in board directors; EQ = Earnings quality; ROE = Return on equity; LEV = Leverage; MtoB = Market to book value; IDIR = ratio of out-side directors to executive directors of the board

Source: Author (EViews Output)

The White test was conducted to investigate the heteroscedasticity problem. Table 2 represents the results of the White heteroscedasticity test. The results indicate that heteroscedasticity problems can be solved using generalized least squares (*GLS*) estimation (Baltagi, 2008).

Table 5. Results of the White Heteroscedasticity Test

	R^2 value from the auxiliary regression	Probability (*p*-value)
Model 1	96.2584	0.000
Model 2	121.3658	0.000
Model 3	102.3671	0.000

Source: Author (EViews Output)

Lastly, serial correlation or autocorrelation of the regression errors was tested using the Durbin–Watson (DW) test (Baltagi, 2008). In general, there is no serial correlation if the DW statistic falls around the value of 2. Table 3 presents the results of the DW test, indicating a positive serial correlation of the regression errors. To solve this problem, the use of the AR(1) term was recommended by Baltagi (2008).

Table 6. Durbin–Watson Test

	Durbin–Watson Statistic
Model 1	1.401
Model 2	1.209
Model 3	1.01

Source: Author (EViews Output)

Results and Discussion

Table 4 shows the results of the regression analysis for all three models. Column 1 presents the results of Model 1, which investigates a direct relationship between females on boards of directors and the information content of stock prices.

The results indicate no direct relationship between females on boards of directors and the information content of stock prices (p-value > 0.01). The results are consistent with Gao (2018), that argued that the link between board gender diversity and stock price informativeness is not

straightforward; board gender diversity can improve stock price informativeness by improving EQ.

The results of Model 2 show a significant negative relationship between the EQ indicator (a reverse measure of EQ) and stock price informativeness. Given that the EQ indicator is an inverse measure of EQ (Mork et al., 2000), a positive relationship exists between EQ and stock price informativeness. That is, as the quality of earnings increases, the information content of stock prices also increases. The results are consistent with those of previous studies (Gao, 2018; Zhou, 2008), indicating that higher quality of earnings is associated with higher price informativeness. Zhou (2008) argued that higher quality of earnings represents lower information risk and cost, resulting in a more informative price. Ball et al. (2000) believed that high-quality earnings indicate high transparency, resulting in high informative prices.

The results of Model 3, which investigates the moderator role of females on boards of directors on the relationship between EQ and informative content of stock prices, are presented in Table 4. The results show that the beta coefficient of EQ in Model 2 is −0.075 (p-value is 0.012, which is statistically significant at 0.05). Meanwhile, the coefficient in Model 3 increased to −0.1 (p-value is 0.003, which is statistically significant at 0.01) by implying the percentage of females on boards of directors as moderating variable (FIDIR × EQ). The results indicate a positive role of female directors in the relationship between EQ and informative prices. That is, the results of this study show that the presence of women in companies with high-profit quality affects the information content of stock prices.

The moderating role of female CEOs on the relationship between EQ and stock price informativeness can be justified through the accounting and governance literature streams.

From the accounting stream perspective, the communal behavior of females, such as speaking tentatively, not drawing attention to oneself, embracing others' viewpoints, supporting and comforting others, and more independent decision-making, would enable female CEOs to focus on managers' decisions and monitor them effectively, thereby increasing the quality of financial reporting and leading to high stock price informativeness (Lara et al., 2017; Aribi et al., 2018; Gull, 2018). Lara et al. (2017) found that independent female directors enhance the boards' oversight of the financial reporting system, resulting in high-quality earnings management. Aribi et al. (2018) indicated that companies with a

higher proportion of female directors are more likely to submit voluntary disclosures than companies with lower proportions of female directors, leading to higher price informativeness. Moreover, the literature on the relationship between gender diversity and earning management has implied the positive role of female CEOs in enhancing the quality of financial reporting (Lara et al., 2017).

The governance stream of the presence of women on boards of directors indicates that more balanced boards, with representation from varied groups (e.g., different genders), are more likely to prevent a single person or a few people from dominating the decision-making process (Kim & Starks, 2016; Wagana & Nzulwa, 2017; Naeem et al., 2022). Kim and Starks (2016) empirically established that women directors contribute to boards by providing unique functional expertise, which often lacks on corporate boards. Such unique functional expertise would increase the knowledge of board members, resulting in efficient board heterogeneity that can boost business value. Adams and Ferreira (2004) recognized that companies with more diverse boards hold more regular meetings and have fewer attendance issues, thereby adding to the efficiency of board governance.

Table 7. Regression Analysis

	Model 1	Model 2	Model3
Intercept	−0.408	−0.407	−0.412
	(0.003) [*]	(0.002) [*]	(0.000) [*]
FIDIR	0.017		0.014
	(0.744)		(0.022) [**]
EQ		-0.075	−0.061
		(0.012) [**]	(0.013) [**]
FIDIR*EQ			−0.10
			(0.003) [*]
ROE	0.039	0.04	0.041
	(0.013) [**]	(0.01) [*]	(0.012) [**]
LEV	−0.126	−0.11	−0.12
	(0.006) [*]	(0.000)*	(0.007) [*]
MtoB	0.02	0.03	0.02
	(0.022) [**]	(0.023) [**]	(0.024) [**]
IDIR	0.059	0.06	0.499
	(0.512)	(0.451)	(0.511)
AR (1)	0.844	0.851	0.848

	Model 1	*Model 2*	*Model3*
	$(000)^*$	$(0.000)^*$	(0.000)
Adj. R^2	0.715	0.712	0.712
Durbin Watson	1.85	1.91	1.87
F-statistics	280.99	285.12	281.2
	$(0.000)^*$	$(0.000)^*$	(0.000)

Source: Author (EViews Output)

Conclusions

This study contributes to theory and practice by examining the effects of female directors on the relationship between EQ and stock price informative in the TSE context, in which there are no specific regulations or guidelines for the gender composition of the sheets of private and public sector CEOs. The results showed that the presence of female directors on boards has a positive role on the relationship between EQ and price informativeness. That is, the relationship between EQ and price informativeness is stronger for companies with more female board members. The theoretical implication of this study is to account for the nature of board activities and integrate them into models of board performance to the degree that women directors have a differential impact on distinct board responsibilities. Moreover, the practical implication of this research refers to the monitoring role of female CEOs, thereby enhancing the quality of financial reporting. Nevertheless, this study has some limitations. The percentage of female directors was used in this study as an indication of board gender diversity without considering the characteristics of the women who serve on corporate boards. Therefore, future studies may benefit from considering several elements of diversity, such as affiliation and demographic diversity at the same time. Lastly, this study suggests the intervention of the government to set guidelines for the sex composition of the board of directors, particularly for companies active in the Tehran stock market.

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