

## RESEARCH ARTICLE

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# Increasing female participation on boards: Effects on sustainability reporting

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## Abstract

Utilizing data on 2,116 stock-exchange-listed banks over a 10-year period (2007–2016), this study examines the relationship between board gender diversity and sustainable reporting. Findings from descriptive analysis show that board diversity tends to be higher with banks endowed with low financial leverage and high assets. Cross-country analysis shows that Central America evinces the highest levels of board diversity among banks. In Europe, however, repose the highest levels of environmental and social disclosure among banks. In contrast, the highest level of governance disclosure among banks obtains in Australia. A regression model partially corroborates the gender board diversity as a causal factor of the corporate governance disclosure inasmuch as, when female board members account for 22–50% of the board, a positive significant effect on the level of ESG disclosure results. However, at levels above 50%, negative returns to scale manifest on ESG disclosure from female board participation. Given the effect on the latter on the former uncovered by this research, regulators ought to mandate quotas of female participation on bank boards to engender sustainable increases in the level of ESG reporting on the part of banks.

## KEYWORDS

board gender diversity, ESG disclosure by banks, sustainability reporting

## 1 | INTRODUCTION

Environmental, social and governance (ESG) disclosure is a term or a concept first coined by the UN Global Compact in 2004 to raise awareness on the part of investors of the importance of such tangible and intangible factors impinging on the sustainability of businesses in terms of their long-term performance. Environmental aspects may include gas emissions, carbon regulation exposure and pollution and contamination. Social and governance

aspects span human rights, labour practices, corruption and bribery, reputation and management effectiveness (environmental, social and governance integration for banks: a guide for implementation, 2014).

Especially gaining momentum after the global financial crisis (2008), which germinated in the banking sector, pressure globally exerted by governments on the private sector to increase the transparency of their operations and their governance structures has perceptibly ratcheted up in response to investor demands and public

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outcry. In response to lax adoption of corporate governance on a voluntary basis in the private sector, governments across the world have launched reform initiatives designed to enhance the quality of corporate governance. In meeting stricter standards of corporate governance, the firms in general and financial companies in particular, have come to the realization that improved ESG reporting, apart from complying with governmental mandates, generates positive externalities enhancing corporate value, to the advantage not only of shareholders but of the labor market, corporate partners, customers and, ultimately, society at large. Bluntly expressed, traditional financial reporting no longer suffices to satisfy the informational needs of a variety of stakeholders, who increasingly demand extension of reporting to include intellectual capital statements, value reporting, and sustainability reports (Wulf, Niemöller, & Rentzsch, 2014). In this context, sustainability reporting is the core element of “good” corporate governance.

The Board of directors is a key element of the governance structure of any business due to the roles that it plays in monitoring and supervising management practices to prevent management from suboptimal allocation of firm resources at the expense of accruing shareholder value through long-term profit maximization. A large body of the literature links composition of board of directors, on the one hand, with governance and performance, on the other hand (Dalton & Dalton, 2010) with board gender diversity being one of the most studied aspects of boards (Abdullah, 2014; Abdullah et al., 2016; S. M. Adams, Gupta, & Leeth, 2009; Hillman et al., 2011; Terjesen et al., 2015). Boards that are diversified in terms of gender exhibit greater commitment to ethics with a greater propensity to take into account interests of a wide variety of stakeholders and communities (Kennedy & Kray, 2014).

In aftermath of the global financial crisis (2008), several researchers posited that excessive risk-taking associated with “masculine thinking” stems from banking sector boards being largely dominated by men. It was claimed that more gender balanced boards would eliminate group thinking and would facilitate overcoming what is called the “Old boys club” (S. M. Adams et al., 2009).

The attention paid to the banking sector may be due to the central role it plays in the economy as a large intermediary that provides liquidity in the form of loans and capital to firms world-wide. Accordingly, the banking sector is a key driver of economic growth with the health of the economy being inextricably tied to the health of the financial sector and with key banks, generally earmarked by the government as “too big to fail.” Systemic failure in the financial sector bodes ill for the survival of the economy (ESG integration for banks: a guide

for implementation, 2014) such that governments often feel compelled to make cash injections to rescue failing banks beset by high percentages of non-performing loans, insufficiently hedged capital positions and exposure to bubbles. With the reputation of the financial sector in tatters, many banks are striving enhance transparency through disclosure of ESG milestones transcending rational reporting confined to financial statements.

The relationship between ESG disclosure and performance has been much explored in the literature (Fatemi et al., 2017; Ioannou & Serafeim, 2016). However, less is known about the factors that drive ESG disclosure (Baldini et al., 2018; Cucari et al., 2017). However, studies exploring these drivers on a sector level are much scarcer in the literature of finance and accounting. Through the prism of the banking sector, this study aims to address that gap in exploring the role of board gender diversity in banks as mechanism for enhancing ESG disclosure. The study juxtaposes macroeconomic and institutional variables on the national level: (GDP, governance, unemployment) with firm and board level characteristics spanning gender diversity, leverage and total assets). The findings are expected to make a significant contribution to the literature of ESG disclosure as drivers affecting performance, especially in banking sector, from an international perspective by providing empirical evidence about the relationship between board gender diversity and ESG disclosure. These findings may also prove insightful for a variety of corporate stakeholders spanning investors, policy makers and researchers (Lückerath-Rovers, 2013).

The study is divided into discrete sections with Section 1 introduction being followed by five sections. Section 2 provides a literature review concluding with hypotheses. Section 3 presents the design and research methodology. Section 4 shows the descriptive statistics. Section 5 presents results of empirical analysis. Section 6 presents the conclusion, recommendations and scope for further research of the study.

## 2 | LITERATURE REVIEW

An editorial by the British Accounting Review, 2018, identifying knowledge gaps that are found in the literature of ESG, indicated the need to investigate ESG practices along each economic sector rather than amalgamating sectors across the economy without differentiating among them. A sectoral approach is warranted inasmuch as each sector demonstrates unique governance systems and stakeholder sets (Francis et al, 2015).

The literature on ESG factors and its relationship with performance is rich and rapidly developing. One stream that may be found in that literature concerns the

effect of ESG disclosure on the financial performance of firms. Fatemi et al. (2017) find that, in the long run, ESG strength increases firm value and, conversely, ESG weakness decreases firm value. In the short run, however, ESG disclosure dampens valuation. In this vein, Qui et al. find that operational performance for a sample of US electronic and computer firms over the long-run positively correlates with ESG disclosure. Furthermore, some studies found a positive correlation between environmental performance and revenue, ROA, profitability and market share (Kassinis & Soteriou, 2003a; Russo & Fouts, 1997; Farrell & Hersch, 2005).

Another stream of ESG research of current salience explores the determinants of ESG on several levels and in multiple contexts (Gardberg & Fombrun, 2006). Baldini et al. (2018) investigate firm-level factors as well as country-level factors affecting ESG disclosure. Heterogeneity manifests in the effect of country-level factors (political system, labour system and cultural system) on ESG disclosure. In contrast, firm-level factors (analyst coverage, cross-listing, leverage and size), without exception, positively correlate with ESG disclosure. Undertaking a study on the national level of analysis, confined to a subset of Latin American countries, Husted and Sousa-Filho (2018), analyzing the effect of board characteristics on ESG disclosure propensity, found that board size and independent directors positively but board gender diversity and CEO duality negatively correlate with ESG disclosure. In a study conducted on Italian-listed firms, Cucari (2018), in investigating the nature and extent to which board of director's characteristics impact ESG disclosure, found a positive correlation between board independence and ESG disclosure but, consistent with the results of Husted and Sousa-Filho (2018), found that board gender diversity negatively correlates with ESG disclosure. In a study of the large French firms, Crifo et al. (2018) uncovered evidence linking corporate sustainability directly with internal forces (inside directors) but inversely with external forces (general expert directors and investor activist engagement). In contrast to the previous findings with respect to the impact of board gender diversity on ESG disclosure, Nadeem et al. (2017), focusing on Australian-listed firms, found that board gender diversity positively correlates with ESG disclosure. However, the study did not differentiate among firms on a sector-by-sector basis.

Hillman (2015) and Kennedy and Kray (2014b) cast board gender diversity as an ethical issue and, indeed, board gender diversity has been a subject of extensive discourse in the literature of corporate governance (Adams et al., 2009; Ararat et al., 2015; Pucheta-Martinez et al., 2016; Terjesen et al., 2015; El-Chaarani, 2014) have found evidence that female directors, in terms of monitoring

function, closely mimic independent directors in efficacy. Overall, board gender diversity is seen as a pillar of the "good governance" indicators that positively affect board performance (Magness, 2006).

## 2.1 | Theoretical framework

The following section provides theoretical background putting into context the model formulated to test the hypotheses limned in this study. Many theories portray corporate governance from different theoretical vantage-points. To understand the relation between corporate management and shareholders, agency theory and stewardship theory have been respectively propounded by Jensen and Meckling (1976) with both of these theories ascribing the ultimate goal of a firm in these theories as maximization of shareholders profits. For depicting the firm as an isolated unit from the outside environment and considering only managers and shareholders as effective parties in an organization, these theories have been criticized. In response, Di Maggio and Powell (1983) developed institutional theory in a paradigm that synthesizes macro-level factors – spanning economics, politics and sociology – that affect corporate activities and behavior. Institutions exert pressure on firms and firms tend to comply with the expectations of these institutions as means to gain legitimacy in the environment in which firms operate. For Di Maggio and Powell, agency and stewardship theory, in their glossing over often stark political, economic and societal differences across operational environments of firms located in diverse countries, are fatally flawed. Institutions tend to affect societal and firm behavior. Oliver (1991) observed that, in societies where gender equality is a priority, firms address diversity issues to a greater extent than do companies operating in societies where gender inequality pervades. Meyer and Rowan (1997) explained how institutional theory contributes to an understanding of uncertainties confronted by corporates that, in response, seek legitimacy by following rules promulgated by these institutions as a risk mitigating mechanism (Eccles et al, 2015).

In striving to overcome shortfalls in the explanatory power of microeconomic theories such as agency theory without neglecting internal environmental variables manifesting in an institutional milieu, Freeman (1984) posits stakeholder theory in recognition that a firm has many stakeholders (shareholders, employees, customers, financiers, political groups etc.) that affect its goals and performance. Inasmuch as stakeholder theory tends to bind firms to its external environment by making ethical choices that legitimize the corporate existence in any context, stakeholder theory better explains corporate

governance better than agency theory does by highlighting different interest groups influencing the behavior of a firm (Coleman, 1988).

Companies ignoring the societal context in which they operate do so at a cost of long-term sustainability. In contrast, companies heeding the societal context in which they operate in meeting specific societal expectations, generate value. Beyond the direct influence exercised on the company by shareholders, stakeholders affect the corporate behavior indirectly (Wheeler, Colbert, & Freeman, 2003). and (Peterson & Philpot, 2007). Giving conflicting interests of various stakeholders, however, companies cannot feasibly accommodate all equally. Rather, for the company to succeed in navigating among a plurality of interests, accommodation to conflicting demands in stakeholder goals through corporate social responsibility (CSR) have to be prioritized according to the overall influence of any given stakeholder relative to the rest in society. In this context, CSR, through sustainability reporting, represents a functional tool of corporate communication with stakeholders and serves as a link between stakeholders and Board members (Roberts, 1992; Low et al, 2015).

Hill and Jones' (1992) stakeholder agent theory combining agency theory and stakeholder theory posits that information reported on sustainability, reduces information asymmetries and the concomitant agency cost that emerges between the stakeholders and corporates (Shankmann, 1999). Strategy aligned with CSR serves to mitigate systemic risk (Botosan, 1997). Accordingly, application of greater weight on sustainability as a decision-making variable will enhance corporate performance. Besides reducing information asymmetries, CSR mitigates conflicts between stakeholders and agents (Eccles & Saltzman, 2011).

This study uses inferences from stakeholder theory and institutional theory to provide an analytic backdrop to better understand what relation, if any, exists between board gender diversity and ESG disclosure in banks across varied institutional settings and environments.

## 2.2 | Measuring sustainability in ESG reporting

Obfuscating the term "integrated report," some firms erroneously consider their annual reports to be integrated without understanding that integration in Reporting melds financial with non-financial performance of the firm. Financial statements, although subject to rigorous accounting standards cannot provide all the information of interest to firms' non-financial stakeholders. Accordingly, in preparing a true integrated annual report, companies issue not only financial statements in compliance

with mandatory financial reporting requirements but also environmental, social and governance (ESG) reports, also known as sustainability reporting, aimed at the informational needs of non-financial stakeholders. Increasingly, firms provide one report that integrates financial with ESG reporting (Jia & Zhang, 2013). However, absence of rigorous standards on a par with GAACP with respect to Reporting of financial data presents complexities in depicting the ESG status of companies through sustainability Reporting (Hillman et al, 2000).

Many databases provide measures of ESG corporate performance. For example, Bloomberg provide ESG metrics and Thomson Reuters provides ASSET4. Bloomberg suggests that ESG indicators can be used for the purpose of assessing firms' sustainable integrated report disclosure. In this study, we use Bloomberg data on ESG performance to measure the sustainable integrated report disclosure.

## 2.3 | Hypotheses development

In line with the previous board gender diversity, empirical studies and the theories supporting both gender diversity and sustainable report disclosure, we can generate one null hypothesis ( $H_0$ ) and two alternate hypotheses ( $H_{-1}$  and  $H_{+1}$ ):

**H0** posits that there is no relationship between gender diversity and sustainability Reporting. disclosure;

**H1** posits that there is an inverse relationship between gender diversity and sustainability.

Reporting disclosure: the greater the gender diversity, the lesser the sustainability Reporting disclosure;

**H1** posits that, alternatively, there is a direct relationship between gender and diversity and.

Reporting disclosure: the greater the gender diversity, the greater the sustainability Reporting disclosure.

## 3 | RESEARCH METHODOLOGY

### 3.1 | Population study, sample and resources of data

Drawing from the Bloomberg database, this study utilizes a selected sample consisting of 7,951 observations for 2,116 stock-exchange-listed banks headquartered in a 10 year period (2007–2016) as mentioned in Table 1. Banks that have ceased operations or that have merged

**TABLE 1** Sample selection

Country	Listed banks	Total observations	Excluded observations	Study sample
Argentina	7	70	40	30
Australia	25	250	190	60
Austria	7	70	50	20
Azerbaijan	33	330	330	0
Bahrain	13	130	90	40
Belgium	6	60	20	40
Bolivia	9	90	90	0
Brazil	19	190	120	70
Bulgaria	5	50	50	0
Canada	14	140	60	80
Chile	8	80	30	50
China	21	210	90	120
Colombia	7	70	20	50
Congo	1	10	10	0
Croatia	12	120	100	20
Cyprus	2	20	20	0
Czech Republic	3	30	10	20
Denmark	22	220	190	30
Ecuador	8	80	80	0
Egypt	13	130	110	20
Finland	3	30	20	10
France	17	170	120	50
Georgia	2	20	20	0
Germany	8	80	50	30
Ghana	6	60	60	0
Greece	8	80	40	40
Hungary	1	10	0	10
India	46	460	90	370
Indonesia	42	420	330	90
Iran	8	80	80	0
Iraq	22	220	220	0
Israel	10	100	50	50
Italy	19	190	80	110
Jamaica	5	50	30	20
Japan	94	940	90	850
Kazakhstan	13	130	110	20
Kuwait	10	100	50	50
Malaysia	10	100	10	90
Mauritius	4	40	40	0
Mexico	8	80	30	50

(Continues)

**TABLE 1** (Continued)

Country	Listed banks	Total observations	Excluded observations	Study sample
Morocco	6	60	50	10
Netherlands	4	40	10	30
Nigeria	18	180	90	90
Norway	30	300	270	30
Oman	8	80	40	40
Pakistan	22	220	160	60
Papua New Guinea	1	10	10	0
Paraguay	8	80	80	0
Peru	21	210	180	30
Philippines	19	190	100	90
Poland	14	140	50	90
Portugal	2	20	0	20
Romania	3	30	10	20
Russia	49	490	440	50
Saudi Arabia	12	120	20	100
Singapore	3	30	0	30
Slovakia	6	60	40	20
South Korea	12	120	60	60
Spain	9	90	30	60
Sudan	19	190	190	0
Sweden	7	70	30	40
Switzerland	47	470	350	120
Syrian Arab Republic	14	140	140	0
Taiwan	19	190	30	160
Thailand	11	110	20	90
Trinidad & Tobago	2	20	10	10
Turkey	14	140	30	110
Ukraine	80	800	780	20
United Arab Emirates	18	180	80	100
United Kingdom	11	110	10	100
United States	1,037	10,370	6,529	3,841
Venezuela	7	70	60	10
Vietnam	12	120	90	30
<b>Total</b>	<b>2,116</b>	<b>21,160</b>	<b>13,209</b>	<b>7,951</b>

with other banks during the research period have been excluded. Pooled data combining both time series data and cross-sectional data are employed.

### 3.2 | Study model

In order to measure the relationship between board gender diversity and bank's ESG disclosure, the study employs a linear model as follows:

$$IR_{it} = \beta_0 + \beta_1 FBM_{it} + \beta_2 TA_{it} + \beta_3 FLEV_{it} + \beta_4 GDP_{it} + \beta_5 UNEM_{it} + \beta_6 GOV_{it} + \beta_7 OPEC_{it} + \varepsilon_{it}$$

where: IR: is a continuous variable; the dependent variable, is the sustainable disclosure measured by three models (e.g., environmental disclosure (ED), corporate social responsibility disclosure (CSR) and corporate governance disclosure (CGD)). ED is the disclosure of bank's energy use, waste, pollution, natural resource conservation and animal treatment of Bank (i) in the period (t). CSR is the disclosure of the bank's business relationships, bank donation, volunteer work, employees' health and safety of Bank (i), in the period (t). CGD is the disclosure of corporate governance code of Bank (i), in the period (t).  $\beta_0$ : is the constant and  $\beta_{1-7}$ : is the slope of the controls and independent variables. FBM: is continuous variable, the independent variable, the percentage of female members on the board divided into three groups (less than 20%, 21 to 50% and more than 50% female member on board), for the Bank (i), in the period (t). TA: is continuous variable, the bank specific control variable, the total assets of the Bank, for the Bank (i), in the period (t). FLEV: is continuous variable, the bank specific control variable, the degree to which a bank uses fixed-income securities such as debt and preferred equity for the Bank (i) in the period (t). GDP: is a continuous variable, the macroeconomic control variable, is the gross domestic product of the country, for the country (i) in the period (t). UNEM: is a continuous variable, the macroeconomic control variable, is the number of unemployed people divided by the number of people in the labor force, for the country (i) in the period (t). GOV: is a continuous variable, the macroeconomic control variable, is the public governance level of the country, for the country (i), in the period (t). OPEC: is dummy variable, the macroeconomic variable, 1 if the country is member of OPEC and 0 otherwise, for the country (i) in the period (t).  $\varepsilon$ : random error.

### 3.3 | Validity model

A linear regression model was used to test the relationship between the board diversity and ESG disclosure.

Several tests were run to check whether data of this study meets conditions of linearity.

As presented in Table 2, to secure approximation of data to normal distribution, a Shapiro–Wilk parametric test and Kolmogorov–Smirnov non-parametric test were used. The null-hypothesis of these tests is that the population is normally distributed. Thus, if the  $p$ -value is less than the chosen .05, then the null hypothesis is rejected which is an evidence that the data are not normal. As shown in the table, the value for all variables was less than 0.05. Despite the large sample size, the data is not normally distributed. On the one hand, however, non-normality can be worked around and, in the end, will not degrade the credibility of inferences made on the population's behavior.

On the other hand, empirical research that uses time series, as in this study, presupposes stability of these series. Autocorrelation might occur in the model in the event that the time series, on which this study is based, is non-stationary (Gujarati & Porter, 2003). To check stationarity of time series, a Unit Root test, which includes the parametric Augmented Dickey-Fuller test (ADF) and non-parametric test Phillips–Perron test, were used. As presented in Table 2, the (ADF) test and (PP) test are statistically significant at the level of 1% – results which mean that the data of time series (2007–2016) are stationary.

As for the strength of the Linear Model, it basically depends on the hypothesis that every variable among the independent ones is by itself independent. If this condition is violated, the Linear Model will then be inapplicable. To assess the independence of the independent variables, to verify that one independent variable does not correlate with another, a Collinearity Diagnostics Standard is used for each independent variable in terms of establishing a Variance Inflation Factor (VIF). This test is the standard that measures the effect of independent variables on one another. Gujarati & Porter, 2003 stated that getting a VIF higher than 10 is indicative of a multicollinearity problem for the independent variable of concern. As presented in Table 2, it can be observed that the VIF values for all independent variables is less than 10 indicative of the absence of any multicollinearity problems in the study models.

To test for autocorrelation, the Durbin Watson (D-W) test is used. Table 2 shows that the D-W values of the variables are within the 1.5–2.5 range indicative of the absence of autocorrelation in these models.

Finally, one of the significant assumptions of the regression model is the presence of homoscedasticity. As shown in Table 2, using Breusch-Pagan and koenker test, we find that the  $p$ -value of the three models is more than .05 such that the null hypothesis obtains. Therefore, these models do not suffer from actual heteroscedasticity.

TABLE 2 Model Validity

Variables	Labels	Measurements	Normality Shapiro-Wilk/ Kolmogorov-Smirnov	Collinearity VIF test	Stationarity ADF/ Phillips-Perron	Autocorrelation Durbin Watson test	Heteroscedasticity Breusch-Pagan test	koenker test
<b>Dependent variables:</b>								
Environmental Disclosure	ED	Bloomberg index which measure the disclosure of bank's energy use, waste, pollution, natural resource conservation and animal treatment	0.000		-5.613***	2.475	0.000	0.001
Corporate Governance Disclosure	CGD	Bloomberg index which measure the disclosure of corporate governance code	0.000		-2.569***	1.578	0.000	0.000
Corporate Social Responsibility Disclosure	CSRSD	Bloomberg index which measure the disclosure of the bank's business relationships, bank donation, volunteer work, employees' health and safety	0.000		-6.810***	2.435	0.000	0.000
ESG Disclosure	ESG	Bloomberg index which combine the ED,CGD and CSRSD	0.000		-4.885***	2.384	0.000	0.000
<b>Independent variable:</b>								
Female Board Member	FMB	Bloomberg index which measure the percentage of female members on the board	0.000	1.084	-13.502***			
<b>Control Variables:</b>								
<b>Bank Specific</b>								
Financial Leverage	FLEV	The degree to which a bank uses fixed-income securities such as debt and preferred equity	0.000	2.303	-31.032***			
Total Assets	TA	The total assets of the Bank	0.000	4.005	-12.671***			
<b>Macroeconomic</b>								
GDP	GDP	The gross domestic product of the country	0.000	1.054	-2.199***			
Governance	GOV	The public governance level of the country	0.000	6.298	-7.219***			
Unemployment	UNEMP	The number of unemployed people divided by the number of people in the labour force	0.000	3.331	-8.689***			

Note: Significance at: \*10%, \*\*5% and \*\*\* 1 levels.

## 4 | DESCRIPTIVE ANALYSIS

In this section, descriptive statistics are presented to provide a general overview of the data prior to hypotheses testing. In addition to the mean, maximum, minimum and *SD*, skewness, to measure the lack of symmetry, and kurtosis, to measure whether the data are heavy-tailed or light-tailed relative to a normal distribution, are presented. Subsequently, cross-region analysis illustrative of cross-regional variation is followed by advanced descriptive analysis utile in evaluating ESG Reporting standards and diversity from varied perspectives. Finally, path analysis serves as technique to engender more profound insights.

### 4.1 | Descriptive statistics

As shown in Table 3, the values for asymmetry and kurtosis between  $-2$  and  $+2$  are considered acceptable in order to prove normal univariate distribution (George, 2011). The median value is lower than the mean value, indicating that the distribution is skewed to the right. (See Table 3).

The result of the descriptive analysis shows that the mean of governance disclosure has the highest value followed by the social disclosure, while the environmental disclosure has the lowest disclosure among the banks. Given that financial sectors are often strictly regulated, the accent on corporate disclosure, on the one hand, suggests that many banks have complied with institutional requirements or strictures applied by regulatory authorities encouraging transparency in corporate behavior. On the other hand, the environmental footprint of banks relative to that of manufacturing or extractive enterprises is small such that environmental disclosure on the part of banks would be of relatively minor import to non-financial stakeholders.

Only a fraction of the all board members are female (13.06%). This suggests that in most countries in the financial sector there is a glass ceiling insofar as promotion of women into senior executive positions is concerned.

### 4.2 | Cross-countries description

In this section, board diversity is contrasted with sustainability reporting indicators of banks located in the top 100 oil producing countries, according to Matt Rosenberg's Official Eight Regional Groupings of the World.

As shown in Table 4, the board diversity mean of these regions has the highest value in Central America

TABLE 3 Descriptive analysis

Descriptive	Independent variables		Dependent variables			Bank specific control variables		Macroeconomic control variables		
	Female board member	Environmental disclosure	Social disclosure	Governance disclosure	ESG	Financial leverage	Total assets	Unemployment	GDP	Governance
Mean	13.016	25.142	35.401	52.352	34.525	17.326	402,155	6.288	3,437,432	80.507
Median	11.111	21.429	35.000	51.786	33.333	15.794	103,616	5.100	1,634,989	80.350
Maximum	60.000	91.071	86.667	85.714	79.386	116.018	3,649,800	27.466	18,036,648	100.000
Minimum	0.000	1.786	3.333	14.286	6.649	2.579	1767	0.580	14,790	9.569
<i>SD</i>	12.369	17.227	18.880	11.679	14.189	9.612	636,390	4.054	4,389,101	17.196
Skewness	0.761	0.514	0.098	-0.254	0.394	0.596	1.300	1.655	1.850	-1.211
Kurtosis	1.926	1.454	1.160	1.169	1.332	1.870	1.838	1.462	1.616	1.067



TABLE 4 Descriptive by region

Variables	Region	Descriptive		
		Minimum	Maximum	Mean
<b>Independent variable</b>				
Female board member	Asia	0.00	75.00	6.38
	Australia	8.33	44.44	22.68
	Central America	18.18	55.56	31.79
	Europe	0.00	60.00	16.11
	Mena	0.00	50.00	6.46
	North America	0.00	50.00	11.95
	South America	0.00	22.22	4.69
	Sub-Saharan Africa	0.00	35.71	15.31
<b>Dependent variable</b>				
1. Environmental disclosure	Asia	1.79	83.93	16.18
	Australia	2.68	59.82	33.53
	Central America			
	Europe	2.68	91.07	34.43
	Mena	0.89	51.79	23.67
	North America	1.79	69.64	28.73
	South America	1.79	61.61	29.01
	Sub-Saharan Africa	2.68	24.11	14.64
2. Social disclosure	Asia	3.33	80.00	23.49
	Australia	3.33	68.33	40.35
	Central America			
	Europe	3.33	86.67	40.79
	Mena	3.33	63.33	28.43
	North America	3.33	86.67	13.42
	South America	3.33	83.33	44.98
	Sub-Saharan Africa	26.67	55.00	38.22
3. Governance disclosure	Asia	14.29	76.79	44.10
	Australia	42.86	78.57	59.30
	Central America	39.29	48.21	44.33
	Europe	10.71	82.14	48.91
	Mena	3.57	67.86	39.05
	North America	3.57	85.71	49.47
	South America	5.36	76.79	38.36
	Sub-Saharan Africa	19.64	69.64	40.24
4. ESG index	Asia	3.51	79.39	17.39
	Australia	11.40	62.28	38.99
	Central America	9.65	11.84	10.89
	Europe	3.51	78.07	32.82
	Mena	2.19	57.89	17.76
	North America	0.88	71.93	14.35
	South America	4.82	67.98	28.29
	Sub-Saharan Africa	4.82	38.60	14.62

(32%). However, the worst diversity mean is found in South America.

In addition, the environmental and social disclosure mean is found to be the best in Europe. However, Australia leads in terms of mean of governance and overall ESG disclosure.

To conclude, each region exhibits profoundly different sustainable disclosure patterns in response, presumably, institutional demands applied in, and the influence of stakeholders on banks across, countries in each region.

### 4.3 | Advanced descriptive analysis

In this section, more advanced descriptive analyses are employed to generate more detailed findings. First, gender diversity groups, in terms of intervals of female board participation, are evaluated in relation to concomitant ESG disclosure levels. Second, gender diversity and disclosure in OPEC and non-OPEC countries are contrasted. Finally, gender diversity and disclosure are explored by rank of oil producing countries.

#### 4.3.1 | Female board classification and disclosure

As shown in Table 5, board diversity is divided into four intervals; Banks with no female members on board,

female member less than 20%, female members between 21 to 50% and female members more than 50%. The results show that mean sustainable disclosure is higher when the female member is between 21 to 50%.

### 4.4 | Board diversity, ESG disclosure based on bank financial leverage

In this section, board diversity and disclosure are bifurcated into two categories: banks with a high level of leverage and banks with a low level of leverage (see Table 6). Path analysis based on the median value of financial leverage to identifies the variance between the means of the two samples using the *t*-test statistic. Analysis using the *t*-statistic test showed that board diversity tends to be higher with banks that have lower financial leverage. However, the three sustainability reporting indicators tend to be higher with firms, the higher financial leverage ratio. Only social disclosure and overall ESG score, however, score were found to be significant in the variance between the means of the two samples (less than 0.05).

### 4.5 | Correlation analysis

Table 7 shows the direction of relationships among all variables which was examined by adopting Pearson

**TABLE 5** Gender classification and disclosure

Variables	Environmental disclosure	Governance disclosure	Social disclosure	ESG disclosure
No female	18.50	43.39	19.96	15.32
Female less than 20%	25.12	48.00	25.93	18.06
Female between 21 to 50%	33.26	52.16	38.88	25.98
Female greater than 50%	20.76	40.48	34.45	20.08

**TABLE 6** Gender diversity and esg disclosure based on bank specific

Variables	Financial leverage				Bank size			
	Mean difference by financial leverage		Difference tests		Mean difference by Bank size		Difference tests	
	High FLEV	Low FLEV	t-Statistic	p-value	High asset	Low asset	t-Statistic	p-value
Female board	10.240	10.765	-1.616	.106	16.508	9.359	18.905	.000***
Environmental disclosure	25.378	24.847	0.613	.540	31.337	19.025	15.287	.000***
Governance disclosure	47.060	46.900	0.519	.604	56.115	45.084	32.183	.000***
Social disclosure	30.759	22.990	9.320	.000***	39.149	18.792	26.981	.000***
ESG disclosure	22.929	16.567	16.126	.000***	37.746	14.556	62.195	.000***

Note: The *t*-statistic is based on parametric test Two-Independent Sample *t* test, The difference Significance at: \*10%; \*\*5% and \*\*\*1% levels.

**TABLE 7** Correlation matrix

Variables	Female board member	Environmental disclosure	Social disclosure	Governance disclosure	ESG
Female Board Member	1				
Environmental Disclosure	0.318***	1			
Social Disclosure	0.302***	0.532***	1		
Governance Disclosure	0.265***	0.671***	0.426***	1	
ESG	0.282***	0.942***	0.618***	0.901***	1

Note: Significance at: \*10%, \*\*5% and \*\*\* 1 levels.

correlation matrix in order to get more insight before testing the hypotheses.

It was found that the correlation coefficients of board diversity indicate significant positive associations at 1% level between gender diversity and all ESG indicators. This correlation between the variables could support alternate hypothesis  $H_{+1}$ . Results suggest that banks with greater board diversity exhibit a higher rate of sustainability reporting disclosure than banks with lesser board diversity.

## 5 | REGRESSION DISCUSSION AND FINDINGS

Validity of the regression models through Hausman and chi-squared testing shown in Table 8 is supported given statistically insignificant results with  $p$ -value exceeding 5% indicating that the random-effect model (RE) best represents the relationship between error terms and independent variables in confirmation of the correlation between the latter and the former.

The regression results reveal that ED, CSRD, CGD and ESG regression models have high statistical significance and high explanatory power as the  $p$ -value of F-test is less than 5% (0.000).

As shown in Table 8, female board in a range of 21–50% exerts a positive impact on ESG as evident from the positive coefficients with  $p$ -values less than 1% (0.000) mandating rejection of the null hypothesis  $H_0$  and acceptance of  $H_{+1}$ . Resource dependence theory suggests that appointing female directors may enhance corporate ESG responsiveness as female directors evince a propensity to bring alternate viewpoints, knowledge and experience to the board. Such qualities contribute to sustainable disclosure.

With respect to environmental and social disclosure, female board participation in the range of 21–50% significantly buoys disclosure of social and environmental issues. To clarify the results, traditional agency theory claims that board diversity enhances

the propensity of boards to disclose accurate information about the company while deterring it from disclosing skewed, self-serving information negatively impinging on corporate performance. Board diversity facilitates transparency in disclosure. In so doing, an increase in gender diversity fosters more sustainable disclosure, which, in the long-term, benefits company performance.

Additionally, two strata of female board participation (less than 20% and between 21–50%) exhibit a positive relationship with corporate governance disclosure. Female minority board participation enhances governance information disclosure rendering, in terms of decision-making, more effective boards. However, female board majority negatively affect corporate governance disclosure as a result of negative marginal returns to scale inasmuch as, as the board approaches a level of 100% female participation, diversity decreases.

For the bank specific control variables, in the ED, CSRD, CGD and ESG models, bank size, to a statistically significant extent, varies in direct relation to sustainability reporting disclosure. In the literature, the empirical relationship between firm size and disclosure is a matter of contention, but there is a consensus regarding the effect of firm size on performance. As a result of superior resource endowments and scale economies, large firms generally outperform smaller. Opposite results obtained with respect to financial leverage, which varies indirectly, to a statistically significant extent, with sustainability reporting disclosure in the ED, CSRD, CGD and ESG models. In a related context, Dhaliwal, Li, Tsang, and Yang (2011) found that firms with high cost of equity are more likely to undertake sustainability reporting disclosure. Dhaliwal, Li, Tsang, and Yang (2014) identified an inverse relationship between sustainability Reporting and the cost of equity. This study supports inclusion of cost of capital as control variable in relation to ESG disclosure propensity.

**TABLE 8** Regression models (Random effect)

Variables	ED Model		CSR Model		CGD Model		ESG Model	
	$\beta$	t-Statistic	$\beta$	t-Statistic	$\beta$	t-Statistic	$\beta$	t-Statistic
<b>Independent variable</b>								
Female board between 1 to 20%	0.055	1.365 (0.173)	0.003	0.115 (0.909)	0.111	5.564*** (0.000)	0.084	4.212*** (0.000)
Female board between 21 to 50%	0.134	2.683*** (0.008)	0.205	4.861*** (0.000)	0.093	2.757*** (0.006)	0.202	6.087*** (0.000)
Female board more than 50%	-0.282	-1.018 (0.329)	-0.396	-1.613 (0.129)	-0.343	-1.825* (0.080)	-0.308	-1.619 0.118
<b>Control variables:</b>								
<b>Bank specific</b>								
Financial Leverage	-0.076	-3.139*** (0.000)	-0.033	-2.124** (0.034)	-0.031	-2.533** (0.011)	-0.041	-3.791*** (0.000)
Total Assets	0.319	13.016*** (0.000)	0.324	20.385*** (0.000)	0.361	29.270*** (0.000)	0.454	41.524*** (0.000)
<b>Macroeconomic</b>								
GDP	-0.147	-6.450*** (0.000)	-0.469	-28.535*** (0.000)	0.104	7.120*** (0.000)	-0.410	-31.709*** (0.000)
Governance	0.127	5.331*** (0.000)	-0.082	-4.912*** (0.000)	0.245	17.532*** (0.000)	0.188	15.219*** (0.000)
Unemployment	0.268	12.213*** (0.000)	0.155	10.127*** (0.000)	0.046	3.828*** (0.000)	0.133	12.568*** (0.000)
R2	0.280		0.456		0.308		0.457	
Adj. R2	0.277		0.454		0.308		0.456	
F-Statistic	100.614		331.999		384.098		725.226	
p-value	.000		.000		.000		.000	
Hausman Test (Chi2)	3.223		2.674		2.211		1.363	
p-value (Chi2)	.214		.338		.119		.261	

Note: Significance at: \*10%; \*\*5% and \*\*\*1% levels.

Finally, with respect to macroeconomic control variables, GDP has been found to vary inversely with ESG disclosure propensity in the four models. Takii and Tanaka (2009) concluded that diversity in human capital depresses GDP. However, unemployment exerts an opposite effect in that unemployment has been found to vary directly with ESG disclosure propensity in the four models. Overall, the governance, to a statistically significant extent, varies directly (with the exception of CSR which varies inversely) with the sustainable Reporting propensity in all models. Results for corporate social responsibility disclosure (CSR) are counter-intuitive unless more effective public governance, in terms of strictness of regulatory oversight of industry, renders disclosure, on CSR, almost superfluous inasmuch as governmental compulsion enforces CSR.

## 6 | CONCLUSION, RECOMMENDATIONS AND FUTURE RESEARCH

In investigating the relationship between gender diversity and sustainability reporting, this study considers the level of gender diversity as a driver of ESG disclosure in banks headquartered in the top 100 oil producing countries in the stock exchange. Data collected are pooled from the Bloomberg database (2007–2016). This study examined 2,116 banks involving 7,951 observations during that 10-year period.

Gender diversity, as an independent variable, has been divided into three percentage intervals: female board participation less than 20%, female board participation between 21 to 50% and female board participation

over 50%. The dependent variables span sustainability reporting indicators (environmental disclosure, corporate social disclosure and corporate governance disclosure). Two types of control variables are used in this study: macroeconomic control variables (Gross Domestic Product [GDP], Governance [GOV], Unemployment [UNEM]) and the bank-specific control variables (Total assets [TA] and Financial leverage [FLEV]).

Descriptive analysis demonstrates that gender diversity tends to be higher with banks that have low financial leverage and high assets. Further, gender diversity is better in banks located in low GDP/high-governance/high-unemployment countries. Regional analysis shows that banks in Central America manifest the highest levels of gender diversity on boards. In contrast, European banks lead in environmental and social disclosures. However, Australia holds the lead in the governance disclosure.

In terms of empirical results, granger causality testing shows that gender diversity is a causal factor in corporate governance disclosure. Moreover, regression modelling supports the finding, at a level of 21–50%, female participation in bank board's positively affects ESG disclosure. In levels in excess of 50%, however, a negative effect obtains with respect to corporate governance disclosure.

Results suggest that the banks should consider enhancing board gender diversity as a fillip to transparency resulting in improved sustainable disclosure, which, over the long-term, engenders improved financial performance. Accordingly, it would behoove banks to establish a minimum threshold level of quota of female participation to assure an optimal level of board gender diversity.

Beyond that, all financial stakeholders, be they investors, shareholders, creditors or debtors, stand to gain, in terms of a value of information perspective, from the institutionalizing of sustainability reporting by corporations: the value of information, in this regard, translates into greater efficiency in terms of investing and lending decision-making. To facilitate comparison across corporations, it would behoove governmental authorities to establish uniform standards of non-financial reporting of corporate performance. In terms of future research, the concept of board diversity can be expanded beyond female participation to include ethnic and racial diversity as possible factors in buoying sustainability reporting. What other factors beyond diversity also affect propensity for sustained integrated report disclosure also merits attention. In addition, board member characteristics can also be examined as determinants of sustainability reporting.

#### DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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