

## **Board gender diversity and integrated reporting quality: Evidence from South Africa**

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### **Abstract**

As the demand for more females on boards increases amidst concerns of female board tokenism, this study examines the board gender diversity (BGD) and reporting quality premise from the perspective of integrated reporting (IR), an innovative reporting mechanism that incorporates financial and sustainability reports. Using static (OLS and fixed effect) and well-developed dynamic panel generalised method of moments (GMM) estimators, for firms on the Johannesburg Stock Exchange (JSE) for the period of 2011 to 2017, the findings of the study reveal a significant positive relationship between BGD and IR quality. The findings remain robust with different measures of BGD and different estimation techniques. The results are essential for the global push for more females on boards and provide more basis for policy debate on the need to increase females on boards to lift the sustainability agenda.

**Keywords:** Board gender diversity; integrated reporting; sustainability; reporting quality; South Africa

### **1. Introduction**

Most governance frameworks, regulatory bodies and stakeholders of capital market participants in recent times are pushing to mandate quotas or encourage board gender diversity (BGD) as an important aspect of corporate governance (European Commission, 2014; Davies Report, 2015; Ferrero-Ferrero, Fernández-Izquierdo, & Muñoz-Torres, 2015; Vafaei, Ahmed, & Mather, 2015). This according to Vafaei et al. (2015, p. 413) is linked to two important reasons: “fairness and equity” on the part of business practices and for improved “shareholder value and firm performance”. These have led to some jurisdictions mandating quotas for BGD (France, Italy, Norway, and Spain), while some others (UK, USA, South Africa) encourage firms to opt for more females on boards.

These demands are expected to restructure boards for improved value and advance ethical decisions on the part of boards (Francis, Hasan, Park, & Wu, 2015; Ho, Li, Tam,

& Zhang, 2015). This quest to increase the number of females on boards (i.e., board gender diversity - BGD) globally has led to several empirical assessments of whether expanding BGD leads to improved performance and reporting quality. Several scholars have thus assessed BGD on firm performance and disclosure quality (i.e., financial, corporate social responsibility and sustainability reporting quality) but with equivocal outcomes (e.g., Giannarakis, 2014; Al-Shaer & Zaman, 2016; Nadeem, Zaman, & Saleem, 2017; Gull, Nekhili, Nagati, & Chtioui, 2018).

Ample empirical studies contend that increased gender diversity leads to improved performance, transparency and quality reporting (Gavious, Segev, & Yosef, 2012; Arun, Almahrog, & Aribi, 2015; Harjoto, Laksmana, & Lee, 2015; Kakabadse et al., 2015; Vafaei et al., 2015; Al-Shaer & Zaman, 2016; Chen, Eshleman, & Soileau, 2016; Nadeem et al., 2017; Gull et al., 2018). Nevertheless, other scholars have established no significant relationship between gender diversity, performance and quality reporting with some claiming that BGD negatively impacts firm value (Wang & Clift, 2009; Carter, D'Souza, Simkins, & Simpson, 2010; Prado-Lorenzo & Garcia-Sanchez, 2010; Ye, Zhang, & Rezaee, 2010; Sun, Liu, & Lan, 2011; Hili & Affess, 2012; Hsu & Cheng, 2012; Chapple & Humphrey, 2014; Giannarakis, Konteos, & Sariannidis, 2014), which have raised questions on whether firms increase female representation on boards only as tokens for implementational quotas and legitimacy purposes (Chen et al., 2016; Gull et al., 2018).

Following the heightened concerns of female board tokenism and the equivocal outcomes of prior literature, this study broadens the BGD and reporting quality literature with a focus on integrated reporting (IR). IR, an innovative reporting mechanism that integrates financial and sustainability reporting, which has fast become the current frontier of corporate reporting and a superior reporting mechanism (Eccles & Serafeim, 2014; Vitolla, Raimo, & Rubino, 2019). As corporate disclosure moves to a more comprehensive, narrative, and integrated form, this study, accordingly, is expected to broaden the BGD and the financial and sustainability disclosure literature immensely.

This study is distinct from existing literature by focusing on the leading emerging economy in Africa (South Africa) as most existing literature on BGD and reporting quality is mostly based on data from developed economies, e.g., USA, Australia, and UK (Srinidhi, Gul, & Tsui, 2011; Al-Shaer & Zaman, 2016; Gull et al., 2018). South Africa presents the ideal data for this study as it currently the only country that mandates the issuance of IR (IODSA, 2016; Johannesburg Stock Exchange (JSE), 2016), it has traditionally discriminated against females in leadership (Ali, Fjeldstad, & Sjursen, 2014; Mans-Kemp & Viviers, 2015) and it has failed in passing a women empowerment and gender equality bill in its parliament<sup>1</sup>. Additionally, this study is unique as it focuses on IR. As per our knowledge, there has been no empirical literature that has expanded the BGD literature to IR.

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<sup>1</sup> Debunking myths about board gender diversity in SA – USB business breakfast 2019 (October 4). [https://www.usb.ac.za/usb\\_news/debunking-myths-about-board-gender-diversity-in-sa/](https://www.usb.ac.za/usb_news/debunking-myths-about-board-gender-diversity-in-sa/)

The equivocal outcomes of prior BGD, performance and reporting quality hypothesis is attributed to methodological problems (e.g., issues of endogeneity, not controlling for some other factors affecting reporting performance or quality, unobserved heterogeneity, etc.) (Vafaei et al., 2015; Nadeem et al., 2017). This study follows Nadeem et al.'s (2017) approach to address the methodological limitations of prior studies on BGD and reporting quality by utilising multiple measures of BGD and addressing endogeneity problems. This study further employs multiple estimation techniques (i.e., static OLS, fixed effect, and dynamic models) for the robustness of the findings.

The findings of this study establish that BGD is an essential element for both financial and sustainability quality reporting, as BGD positively associated with IR quality. The result was robust for all estimation techniques used: static – OLS and fixed effect, and dynamic – system GMM. This indicates that firms with more females on boards tend to produce higher quality IR. When BGD is viewed from the critical mass theory perspective (i.e. having a minimum of three females on boards), the results confirm that females' directors are an essential element for quality IR, throwing away the concerns of females board tokenism.

The remaining sections of this paper are organised as follows. Section 2 reviews and develops hypotheses based on the related literature. Section 3 is about the chosen methodology and the sample for this study. While section 4 analysis and discusses the findings of the study. Section 5 provides concluding remarks and the implications of the findings.

## **2. Literature review and hypothesis development**

A new reporting mechanism (i.e., IR) that seeks to integrate both financial and sustainability reports is gaining ground in the last decade (Eccles & Serafeim, 2014; Maniora, 2017). IR is defined as “a concise communication about how an organisation’s strategy, governance, performance, and prospects in the context of its external environment, lead to the creation of value in the short, medium and long-term” (IIRC, 2013b, p.7). IR’s essence is to enhance accountability, stewardship, trust, and transparency in information flow for effective investment decision making (Chaidali & Jones, 2017). The idea has gained significant acceptance (Eccles & Serafeim, 2014), and become the current frontier of corporate reporting (Vitolla et al., 2019) due to its perceived benefits (Barth, Cahan, Chen, & Venter, 2017; Bernardi & Stark, 2018). This is increasing the consideration of IR as a robust reporting framework with transformational effects (IIRC, 2013a; Maniora, 2017). Barth et al. (2017) and García-Sánchez and Noguera-Gámez (2017) argue that IR possesses the space and avenue to perfect the insufficiencies within the existing reporting frameworks it integrates (i.e., financial and sustainability reporting).

With the perceived benefits, many scholars have turned their attention to IR. Most have concluded that IR was introduced to promote corporate strategy and advance corporate reporting quality (Thomson, 2015; Barth et al., 2017; Hsiao & Kelly, 2018). Pistoni, Songini, and Bavagnoli (2018, p. 2) project that IR is superior as it provides “comprehensive and comprehensible information about the organisation’s total performance, prospective as well as retrospective”. García-Sánchez, Rodríguez-Ariza, and Frías-Aceituno (2013) add that IR reports are meant to deliver high quality and detailed accounts of organisations. Maroun (2017) and de Villiers, Hsiao, and Maroun (2017) assert that IR will make organisations more accountable, responsible, and

transparent. However, the mere adoption and application of IR principles for IR reports do not guarantee the quality of the report (Frías-Aceituno, Rodríguez-Ariza, & García-Sánchez, 2013). Stacchezzini, Melloni, and Lai (2016) posit that the nature of IR makes it a suitable tool for impression management. Even the practicality of how IR captures actual operations of firms is questioned (Higgins, Stubbs, & Love, 2014; Stubbs & Higgins, 2014; de Villiers et al., 2017). Making IR and achieving quality and credible IR prone to the ethical stance of boards. Thus, highly ethical boards are expected to issue credible and quality IR. It is on this notion that some studies project that boards with an increasing number of female directors are expected to enhance IR quality, as females are noted to be more ethical, risk-averse, better monitors of management, and less prone to immoral activities in their professional activities than their male counterparts (Peterson & Philpot, 2007; Adams & Ferreira, 2009; Kaplan, Pany, Samuels, & Zhang, 2009; Garcia-Sanchez, Martínez-Ferrero, & García-Meca, 2017). The inclusion of more females on boards is perceived to advance the ethical behaviour of boards and improve boards value (Francis et al., 2015; Ho et al., 2015). Notwithstanding, the impact of a diversified board on the quality of IR has not been empirically tested.

A well-diversified board is an important resource for organisations' growth and survival. Therefore, literature holds that diverse boards represent a wider stakeholder group (stakeholder theory), ensure to organisations well-equipped directors who are bequeathed with different and broader skill-sets, traits, and abilities to deal with the ever-increasing challenges of organisations, to be accountable to stakeholders by ensuring quality reporting (Cabeza-García, Fernández-Gago, & Nieto, 2018; Wahid, 2019). These critical resources enhance the monitoring ability and governance decisions of the board for improved performance (Gul, Srinidhi, & Ng, 2011; Srinidhi, Gul, & Tsui, 2011; Frynas & Yamahaki, 2016). Though board diversity can be assessed from several grounds (e.g., age, race, ethnicity, or tenure), Wahid (2019) and Cabeza-García et al. (2018) suggest that traits with governance impact are mostly distributed across genders, hence the focus of this study on BGD. Besides, this study pivots on BGD on the basis that a highly gender diversified board offers more independent thinking, assessment and much more monitoring abilities that enhance board effectiveness towards all its functions which include quality corporate disclosure (Adams & Ferreira, 2009; Abbott, Parker, & Presley, 2012; Wahid, 2019). These to Wahid (2019, p. 707) leads to "less biased and superior decision-making" on the part of the board.

From the unique characteristics of females, one can argue that females on boards are a potential panacea for strengthening stakeholder engagement, ensuring a responsible board, and increasing corporate reports quality and credibility (Manetti & Toccafondi, 2012). Several scholars in this line have assessed that females in leadership often produce a number of influential outcomes (e.g. Srinidhi et al., 2011; Levi, Li, & Zhang, 2014; Vafaei et al., 2015; Faccio, Marchica, & Mura, 2016; Chen, Leung, & Goergen, 2017; Nadeem et al., 2017). For related BGD studies, several scholars contend that increasing female board representation leads to improvements in board performance and quality reporting. To Gull et al. (2018), increased female presence on boards deters the practice of earnings management, while Abbott et al. (2012) contend that it reduces accounting restatements. Nadeem et al. (2017) confirm that increased women representation on boards leads to improved corporate sustainability practices. These findings have led to increasing levels of females on boards across the world, with some jurisdictions mandating quotas for gender diversity (France, Italy, Norway, and Spain) (Higgs, 2003; De Beaufort & Lucy, 2013; Davies Report, 2015).

Notwithstanding the increasing number of females on boards and the resource potential embedded in diversified boards, other scholars contend that BGD has no significant impact on performance and reporting quality. Giannarakis (2014) posits that female presence on boards has no significant impact on the extent of CSR disclosure. Similarly, Hsu and Cheng (2012) assert that gender diversity has no significant influence on firms to engage in CSR. From a financial reporting point of view, Hili and Affess (2012) could not link increases in earnings persistent to BGD. They further could not establish any significant differences between males and females on the earnings persistence of firms. Sun et al. (2011) could not establish any effect of females in audit committees on the extent of earnings management. Ye et al. (2010) and Wang and Cliff (2009) conclude that there is an insignificant relationship between BGD and earnings quality and performance.

These insignificant findings of BGD on reporting quality and performance have been attributed to what is currently termed the degree of gender diversity (Chapple & Humphrey, 2014) - to what extent is the board diversified by gender -. The critical mass theory, therefore, postulates that for any significant impact of BGD on performance and/or reporting quality, there is the need for a minimum number of females on boards (Torchia, Calabrò, & Huse, 2011; Jia & Zhang, 2013). Based on this assertion, lots of papers contend that for any significant changes in boardroom activities, corporate decision making and corporate reporting by females there should be a minimum of three female directors on the board (Konrad, Kramer, & Erkut, 2008; Torchia et al., 2011; Chen et al., 2016). Any number less than the threshold will mostly result in “tokenism”, where females on boards are seen as “tokens” with insignificant impact on corporate decision-making (Bear, Rahman, & Post, 2010; Jia & Zhang, 2013). In this vein, increasing the number of female representatives on boards is expected to improve on females’ contributory power on boards.

Following from the above discussions and the advancement of boards ethical behaviour linked to increased females on boards, this study expands the BGD and reporting quality literature by focusing on IR quality, an innovative-emerging reporting mechanism that integrates financial and sustainability information for enhancing accountability, stewardship, trust, and transparency in information flow for effective investment decision making. Accordingly, the main proposition made in this study is that board gender diversity positively impacts the quality of both financial and sustainability disclosures in integrated reporting.

### **3. Methodology**

#### **3.1. Research design**

This is a quantitative study focused on testing the causal relationship of BGD on firms financial and sustainability disclosure quality with a focus on IR.

#### **3.2. Sample and data sources**

For assessment of the impact of gender diversity on IR quality, listed firms on the Johannesburg Stock Exchange (JSE), South Africa are sampled for this study. Unlike other countries and exchanges across the world, South Africa and the JSE are the only mandatory environment for the issuance of IR reports (IODSA, 2016; Johannesburg Stock Exchange (JSE), 2016). Hence, the appropriate environment for this study. Top 100 firms on JSE based on market capitalisation are sampled for this study. This aligns with Barth et al. (2017) that the top 100 listed firms on JSE represent over 90% of the exchange market capitalisation. However, firms without a complete IR report and firms

listed after 2011 are excluded as firms on JSE complied and begun issuing IR reports from 2011. Sixty-two firms qualified as the sample for this study for the study period of 2011 to 2017. Data for this study are gathered from the Bloomberg database as well as IR reports of sampled firms.

### 3.3. Model specification

In assessing the impact of gender diversity on IR quality, this study, along with most corporate governance studies, employed ordinary least square (OLS) and fixed-effect models (Giannarakis et al., 2014; Dal Maso, Liberatore, & Mazzi, 2017; Fiechter & Novotny-Farkas, 2017). In addition, this study employed system GMM due to the dynamic nature of corporate governance (CG) and reporting quality relationship (Wintoki, Linck, & Netter, 2012; Nguyen, Locke, & Reddy, 2014).

The static models (OLS, fixed effect, etc.) are identified to suffer endogeneity bias (e.g., reverse causality and omitted unobserved factors) as they assume a static relationship between CG and reporting quality. Though panel estimations like fixed effect are used in the literature to account and alleviate the bias of omitted unobserved factors, the endogeneity bias of reverse causality is not accounted for (Wooldridge, 2010; Manita, Bruna, Dang, & Houanti, 2018). A lead-lag analysis is thus utilised in line with the literature to assuage concerns of reverse causality within the static estimation techniques (Li, 2016; Bellemare, Masaki, & Pepinsky, 2017; Manita et al., 2018).

This study thus adopts the following static regression model;

$$IRq_{it} = b_0 + b_1BGD_{it} + b_2FSize_{it} + b_3FLev_{it} + b_4ROA_{it} + b_5BSize_{it} + b_6BInd_{it} + b_7ACInd_{it} + B_8Big4_{it} + \varepsilon_{it} \text{-----}(1)$$

In addition, due to the revelation that corporate governance (CG) and reporting quality relationships are not static but dynamic, and static estimations are limited in dealing dynamic endogeneity biases (Wintoki et al., 2012; Nguyen et al., 2014), this study also employed a two-step system GMM. A two-step system GMM is seen as the ideal estimator for such conditions (Wintoki et al., 2012).

This study followed Wintoki et al. (2012) use of Wooldridge (2010) strict exogeneity test to determine whether BGD is an endogenous variable. In line with Wooldridge (2010), the future values (t+1) of BGD were regressed on IR quality. The significant relationship established (0.3871,  $p < 0.01$ ) indicates BGD as an endogenous variable (Wooldridge, 2010).

With the confirmed endogeneity and the dynamic nature of the relationship under assessment, this study followed the dynamic model literature and used system GMM estimation for equation 2 by including the lagged dependent variable ( $IRq_{it-1}$ ) as a control variable in the model.

$$IRq_{it} = b_0 + b_1IRq_{it-1} + b_2BGD_{it} + b_3FSize_{it} + b_4FLev_{it} + b_5ROA_{it} + b_6BSize_{it} + b_7BInd_{it} + b_8ACInd_{it} + B_9Big4_{it} + \varepsilon_{it} \text{-----}(2)$$

### 3.4. Measurement of variables

#### 3.4.1. Integrated reporting quality

Based on a content analysis methodology, IR quality is assessed on a weighted score measure. Content analysis criticisms are dealt with by using two researchers for assessing the quality of IR by thoroughly reading and scoring each sampled firm's IR report separately (Krippendorff, 2004, 2012). The quality of the reports is assessed based on the alignment of each firm's IR reports to the IR framework by the

International Integrated Reporting Council (IIRC) (Zhou, Simnett, & Green, 2017; Zhou, Simnett, & Hoang, 2018). Based on this, an alignment checklist and scoring scheme by Zhou et al. (2017) and Ahmed Haji and Anifowose (2016) are adopted in assessing the quality of each firm's IR for each sampled year (see Appendix, for the checklist). The Intra-class, Pearson, Spearman, and Kendall correlations of the results of the two coders are 0.9709, 0.9712, 0.9705, and 0.8655, respectively, for IR quality. Differences in scores of the two researchers are deliberated upon and reconciled for a single measure of IR quality.

3.4.2. Board gender diversity

In line with the literature, the resource dependency theory, and the critical mass theory, this study assesses gender diversity in two ways. First as a percentage of females directors on boards and second as a dummy variable where 1 is assigned if three (3) or more females are on firms board, otherwise, 0 is assigned (Prado-Lorenzo & Garcia-Sanchez, 2010; Jia & Zhang, 2013; Chen et al., 2016; Wahid, 2019). The dummy variable measure is to assess the BGD and quality reporting premise based on the critical mass theory assertion on the need for a certain minimum number of females on board for any significant impact.

**Table 1. Variable Definition**

Variables	Definition
Dependent Variable	IR quality (IRq) = the content analysis methodology with a weighted score measure based on Zhou, Simnett, and Green (2017) and Ahmed Haji and Anifowose (2016) checklist and scoring scheme. IRq = Actual firm score/Maximum score. (see Appendix for the checklist and a website link to the scoring scheme).
Independent Variables	BGD percentage (BGDp) = percentage of female directors on boards BGD dummy (BGDd) = a dummy variable, 1 is assigned if three (3) or more females are on board; otherwise, 0 is assigned
Control Variables	Firm Size (FSize) = the natural logarithm of total assets Performance (ROA) = the ratio of net income to the revenues Leverage (FLev) = the ratio of total debt to total assets Board Size (BSize) = the natural log of the number of board members Board Independence (BInd) = the proportion of non-executive or independent directors on the board Audit Committee Independence = the proportion of non-executive or independent directors on the audit committee of the board Big4 = a dummy variable, 1 indicates Big4 accounting firm, 0 otherwise as a measure of external audit quality

3.4.4. Control variable(s)

Consistent with prior literature considering quality reporting, this study controls for firm and governance characteristics that have the likelihood of impacting the quality of IR reports. Firms' characteristics, like firm size, performance, leverage, and big4 external audit firms, are controlled for. This study measures firms size as the natural logarithm of total assets (Artiach, Lee, Nelson, & Walker, 2010). Firm leverage is measured as the ratio of total liabilities to total assets (Alazzani, Hassanein, & Aljanadi, 2017). Return on assets is the study measure of performance assessed as the ratio of net income to revenues (Brammer & Pavelin, 2008) while Big4 represents the quality of external auditing, measured by a dummy variable where one (1) is assigned if on a given year a firm is audited by a Big4 accounting firm, otherwise, zero (0) is assigned.

Board size is measured as the natural log of the number of board members, board independence is assessed as the percentage of non-executive directors to total board size, while audit committee independence are based on the percentage of non-executive directors on the audit committee of the board (Srinidhi et al., 2011).

## 4. Empirical Results and Discussion

### 4.1. Descriptive analysis

Table 2 contains the descriptive statistics for each variable in this study. The dependent variable, IR quality ranges from .05 to .87 with an average of .59. The high average score suggests the quality of IR for the sampling period are higher for the sample firms on JSE. For the two measures of BGD, BGDp recorded a mean of .2023 while BGDd recorded .4424. These suggest that on percentage wise female directors' account for about 20% of total directorship among the sampled firms. And close to half (44.24%) of the firms had at least three female members on their boards at a given sample period. The 20% BGD, seem high when compared to studies in other jurisdiction (e.g., 10.33% for Australia by Nadeem et al. (2017) and 15.85% for USA by Manita et al. (2018)).

**Table 2. Summary Statistics**

Variables	Mean	Std. Dev	Min	Max	<i>n</i>
IRq	.5901	.1431	.05	.87	434
BGDp	.2032	.1071	0	.5	434
BGDd	.4424	.4972	0	1	434
FSize	4.4085	.6581	2.33	6.31	434
ROA	.0894	.1063	-.25	1.21	434
FLev	.5627	.2135	0	1.02	434
BSize	1.0744	.1044	.78	1.38	434
BInd	.7411	.1125	.08	1	434
ACInd	.9907	.0539	.60	1	434
Big4	.9562	.2048	0	1	434

Note: See table 1 for variable definitions. The table presents the corresponding means, standard deviations (Std.Dev.), minimum (Min) and maximum (Max) values of the variables for the study.

For firm and governance characteristics used as control variables, FSize recorded a mean of 4.4085 with a range of 2.33 to 6.31. The closeness of the mean to both the minimum and maximum scores indicates that sampled firms are of similar size affirming the population from which firms were sampled; the top 100 firms on JSE. Performance (ROA) recorded a mean of 8.94% in the mix of both positive and negative performances. The mean value for leverage (56.27%), signify that sampled firms are highly geared. On average, almost all the sampled firms are audited by one of the Big4, with a mean score of .9562. For governance characteristics, approximately 74.11% of the board of directors are non-executive directors, with about 99.07% constituting audit committee independence while the average board size (BSize) based on the natural logarithm of the total number of directors stood at 1.07.

### 4.2. Correlation analysis

Table 3 documents the Pearson correlation matrix for variables for this study. The two proxies for BGD significantly positively correlated IRq, the dependent variable of the study at .3173 and .3286 respectively for BGDp and BGDd at 1% significant level. Supporting the tentative hypothesis of this study. Except for performance (ROA), all firm and governance variables significantly positively correlated with the dependent variable of the study (IRq). From the correlation table, the correlations among the



control variables are within the accepted threshold, hence no concerns with multicollinearity.

**Table 3. Correlation Matrix**

	IRq	BGDp	BGDd	FSize	ROA	FLev	BSize	Blnd	ACInd	Big4
IRq	1.000									
BGDp	.317***	1.000								
BGDd	.329***	.653**	1.000							
FSize	.415***	.010	.221***	1.000						
ROA	-.046	-.032	-.047	-.258***	1.000					
FLev	.224***	.212***	.286***	.421***	-.419***	1.000				
BSize	.260***	-.042	.320***	.534***	-.089*	.259***	1.000			
Blnd	.170***	-.135***	-.049	.184***	.048	-.093*	.088*	1.000		
ACInd	.081*	.004	.0196	.022	.083*	.057	-.037	.013	1.000	
Big4	.255***	-.112**	-.059	.306***	-.047	.008	.189***	.172***	.101**	1.000

Note: The table contains Pearson correlation coefficients. \*\*, \*\*\* represents significance level at 5% and 1% respectively

### 4.3. Empirical results

#### 4.3.1. GMM validation

This section presents the empirical results on the effect of BGD on IR quality. To deal with endogeneity and the dynamic nature of the relationship, both static and dynamic estimations are employed. The GMM approach is considered the ideal estimation technique in such circumstances but with valid criticism on weak instrumental identification. For robustness of GMM, several tests for system GMM instrumental validation were considered (Arellano & Bond, 1991).

Per table 4, column 11 and 12, the Arellano-Bond Test for second-order serial correlation (AR1 and AR2), the Henson J test of over-identifying restriction and the Hausman specification test are applied (Arellano & Bond, 1991). AR1 are significant, signifying that enough lags for controlling the dynamic aspect of the relationship exist. The p-values of the AR2 second-order serial correlation are .674 and .721, indicating the null hypothesis of no serial correlation holds. Henson J test for both models (BGDp and BGDd) are insignificant, implying that the null hypothesis of instruments are valid cannot be rejected. Furthermore, the results of differences in Hansen test of exogeneity for system GMM style and IV style suggest there is no basis to reject the null hypothesis that subsets of the instruments are economically exogenous (Wintoki et al., 2012; Nguyen et al., 2014).

#### 4.3.2. Main results

From table 4, BGD is found to positively relates IR quality for all the static estimation techniques (OLS and fixed effect). This outcome aligns with several empirical studies that suggest that inclusion of more females on boards provides critical resources for enhancing governance decision which leads to improved transparency and reporting quality (Gavious et al., 2012; Arun et al., 2015; Harjoto et al., 2015; Kakabadse et al., 2015; Vafaei et al., 2015; Al-Shaer & Zaman, 2016; Chen et al., 2016; Nadeem et al., 2017; Gull et al., 2018). The findings further seem to agree with the view that the inclusion of females on boards advance the ethical behaviour of boards for quality reporting (Francis et al., 2015; Ho et al., 2015).

On the bases, that static estimation techniques (OLS and fixed) in the presence of dynamic panels produce bias estimates with upwardly bias and inconsistent estimates for OLS while fixed effect estimates are biased downward and inconsistent (Nguyen et

al., 2014), this study further employed system GMM. The system GMM estimation technique is noted to produce more accurate estimates that are well below OLS and above fixed effect estimates (Bond, 2002). Following this, one-year lagged of IR quality was added to the model (equation 2) to test the dynamic nature of the relationship. Column 9 to 12 confirms the dynamic nature of BGD and IR quality with a significant positive relationship between lagged IR quality and IR quality. Implying that past IR quality of firms has implications on the current performance of IR quality, hence an important control variable for the study's model for a robust estimate of the effect of BGD on IR quality.

This also suggests that the results of the static models are biased. Notwithstanding, the significant positive relationship between BGD and IR quality is maintained even in the dynamic models (Column 9 to 12), using the system GMM estimation technique. These results further affirm that increasing the number of females on boards ensure a lot of benefits to organisations which includes quality reporting. Thus, after using system GMM to alleviate concerns with the static estimation techniques and to deal with dynamic endogeneity biases (Wintoki et al., 2012; Nguyen et al., 2014), the findings still affirm that BGD is an important factor for IR quality.

#### 4.3.3. *Robustness checks*

For further robustness of the results, the study used a second measure BGD (i.e., BGDd). From columns 2, 6, 10 and 12 of Table 4, the findings of the study are robust to the second measure of BGD. Thus, for the static models (OLS and fixed effect) and the dynamic estimation technique, the BGDd positive and significantly impacted firms IR quality.

**Table 4. Regression output**

	Dependent Variable: IR Quality											
	Static Model								Dynamic Model			
	OLS				Fixed effect				OLS		GMM	
	1	2	3	4	5	6	7	8	9	10	11	12
LagIRq									.8507*** (.0255)	.8585*** (.0251)	.8168*** (.0399)	.7949*** (.0452)
BGDp	.3653*** (.0526)				.2792*** (.0596)				.0801*** (.0290)		.2913*** (.0233)	
BGDd		.0664*** (.0120)				.0348*** (.0102)				.0147** (.0065)		.0522*** (.0102)
LagBGDp			.4058*** (.0583)					.2201*** (.0701)				
LagBGDd				.0748*** (.0131)				.0290** (.0115)				
FSize	.0471*** (.0110)	.0430*** (.0112)	.0435*** (.0120)	.0399*** (.0112)	.2671*** (.0200)	.2878*** (.0196)	.2741*** (.0246)	.2979*** (.0243)	.0043 (.0061)	.0022 (.0061)	.0017 (.0068)	.0009 (.0090)
ROA	.1248** (.0561)	.1300** (.0573)	.1199** (.0598)	.1404** (.0608)	.0448 (.0382)	.0483 (.0387)	.0558 (.0377)	.0678* (.0385)	.0193 (.0297)	.0190 (.0299)	.0292* (.0161)	.0162 (.0165)
FLev	.1272** (.0311)	.0760** (.0315)	.0668** (.0333)	.0811** (.0338)	-.0208 (.0391)	-.0345 (.0397)	-.0336 (.0420)	-.0374 (.0426)	.0020 (.0166)	.0045 (.0166)	.0089 (.0187)	-.0138 (.0212)
BSize	.1272** (.0605)	.0166 (.0637)	.1199* (.0665)	-.0088 (.0702)	.0153 (.0695)	.0029 (.0710)	-.0019 (.0764)	-.0392 (.0784)	.0222 (.0331)	-.0016 (.0339)	.0489 (.0342)	-.0107 (.0337)
BInd	.1624*** (.0490)	.1440*** (.0498)	.1612*** (.0526)	.1465*** (.0535)	.1087** (.0527)	.1124** (.0535)	.1631*** (.0559)	.1676*** (.0567)	.0454* (.0262)	.0408 (.0262)	.0428** (.0209)	.0416* (.0238)
ACInd	.1199 (.0999)	.0930 (.1018)	.1067 (.1201)	.0798 (.1226)	.4379*** (.0974)	.4260*** (.0987)	.1878 (.1452)	.2011 (.1480)	.0305 (.0594)	.0282 (.0596)	.0255 (.0547)	.0360 (.0509)
Big4	.1140*** (.0277)	.1179*** (.0283)	.1316*** (.0313)	.1360*** (.0321)	.0889** (.0375)	.0758** (.0381)	.0475 (.0487)	.0346 (.0497)	.0096 (.0158)	.0096 (.0159)	.0083 (.0149)	.0153 (.0153)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effect	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Constant	-.2940** (.1177)	-.0918 (.1198)	-.1513 (.1007)	.0795 (.1433)	-1.2510*** (.0158)	-1.2586 (.1608)	-.9900*** (.2124)	-1.0280*** (.2159)	-.0282 (.0699)	.0311 (.0700)	-.0367 (.0726)	.0555 (.0702)
Adjusted R <sup>2</sup>	.3994	.3759	.3601	.3347	.2395	.2107	.1994	.1787	.8434	.8424		
F Statistics	21.47	19.54	16.98	15.32	19.82	20.95	18.76	19.50	143.35	142.23	171.64	149.46
Prob. > F	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Observations	432	432	370	370	432	432	370	370	370	370	370	370
Number of Instruments											29	29
Number of clusters											62	62
AR1											0.005	.004
AR2											0.674	.721
Hansen J. (p-value)											0.525	.595
Difference-in-Hanse J. for GMM style (p-value)											0.462	.852
Difference-in-Hanse J. for IV style (p-value)											0.265	.682

Also, following the assumption that  $Y_t$  cannot explain  $X_{t-1}$  (Bellemare et al., 2017), this study employed lead-lagged analysis for the static estimation techniques. Columns 3, 4 (OLS) and 7, 8 (fixed effect) affirm the findings of the study that BGD is a key factor for IR quality for both measures of BGD. This aligns with the view that with time, board characteristics, in this case, BGD influences reporting quality (Manita et al., 2018).

Overall, the positive relationship between BGD and IR quality aligns with the theoretical predictions underpinning stakeholder perspectives. Thus, the findings portray that increasing the number of females on boards leads to a wider representation of stakeholders, hence it advances independent thinking, assessment, and monitoring abilities that promote positive board outcomes, including quality IR.

Although this study is based on an environment that has traditionally discriminated against females in leadership and with no explicit rule on the number of females on boards (Ali, Fjeldstad, & Sjursen, 2014; Mans-Kemp & Viviers, 2015), the finding further provides a basis for the continuous call for increasing the number of females on boards.

## **5. Summary and Conclusion**

This study, from the perspective of IR, a new and innovative reporting mechanism that is gaining traction all over the world, and an environment that traditionally discriminated against females, examine the BGD and reporting quality premise. To further advance policy on the subject.

Notwithstanding the low proportion of females on boards, this study after using both static and well-developed dynamic panel GMM estimators to control endogeneity concerns, concludes that the presence of females on boards is a key determinant of IR quality. The positive and significant finding remained robust when the alternative measure of BGD is used, and when the lead-lag analysis was also applied.

The outcome aligns with the theoretical view of stakeholder theory on the view that more diverse boards hold more resources and represents a wider stakeholder of the firm to advance firm outcome. On practical implication, the finding of this study portrays that in firms quest to adopt IR and ensure quality IR, increasing females on boards are essential.

This study contributes to the growing IR literature and the BGD and reporting performance literature with a focus on an innovative reporting mechanism, IR. Notwithstanding, the advancement of literature, the findings of this study are limited to a one country analysis. There is a need to have a multi-country analysis of the effect of BGD on the reporting quality of IR. Future studies can also examine the difference between listed and non-listed firms in relation to BGD and IR quality relationship.

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## Appendix

### Appendix. Checklist of Integrated Reporting Quality \*

Element	Component
1. Organisational overview and operating context What does the organisation do and what are the circumstances under which it operates?	Reporting boundary
	Mission and value
	Business Overview
	Operation context
	Summary statistics
2. Governance What is the organisation's governance structure, and how does it support the organisation's ability to create value in the short, medium and long terms?	Governance structure
	Governance and strategy
	Remuneration and performance
	Governance and others
3. Opportunities and risks What are the key opportunities and risks that the organisation faces?	Risks
	Opportunities
4. Strategy and resource allocation plans Where does the organisation want to go and how does it intend getting there?	Strategic objectives
	Links between strategy and other elements
	Competitive advantage
	Stakeholder consultations
5. Business model What are the organisation's key inputs, value-adding activities and outputs by which it aims to create value over the short, medium and long terms?	Business model
	Business model and others
	Stakeholder dependencies
6. Performance and outcomes How has the organisation performed against its strategic objectives and related strategies, and what are the key outcomes resulting from its activities?	KPIs against strategy
	Explanation of KPIs
	Stakeholder relationship
	Past, current and future performance
	Financial implications
	Supply chain performance
	The quality of quantitative indicators
7. Future outlook What opportunities, risks, challenges and uncertainties is the organisation likely to encounter in pursuing its strategic objectives, and what are the potential implications for its strategies and future performance	Anticipated changes
	Potential implications
	Estimates
8. Other elements What are the other elements which reflect the guiding principles of integrated reporting, but are not specifically mentioned in the content elements?	Conciseness and links
	Materiality process
	Sign-off

References: Ahmed Haji and Anifowose (2016) and Zhou et al. (2017).

\*) The detailed checklist and the scoring scheme adopted can be accessed on this website:  
[https://drive.google.com/file/d/186qpcC2CLiKZCSFXqVqRG\\_uY6rJXQEMw/view?usp=sharing](https://drive.google.com/file/d/186qpcC2CLiKZCSFXqVqRG_uY6rJXQEMw/view?usp=sharing)