



Wisdom that Equality Tends to Offer: The Case of Real Earnings Management Practices of Female Directors in IT-friendly Firms of Bangladesh

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Abstract: *In this study, we analyze how female directorship and real earnings management of IT-friendly firms are empirically interrelated in context of an emerging economy, viz. Bangladesh. We undertake relevant statistical procedures by utilizing a sample of 1914 firm-year observations as listed on the Dhaka Stock Exchange throughout the period of 2000-2017. Our results imply that firms with female director(s) are more likely to be involved in real earnings management. On the other hand, we also underscore that IT-friendly firms are less likely to be engaged in real earnings management and to provide superior-quality financial reports whereas the significance of this observation becomes more pronounced when conjoined with appointment of female directors in similar firms. We also find that IT-friendly firms with female directors are less probable to be involved in earnings management when compared to both IT-friendly firms with male director(s) and non-IT friendly firms. Based on the evidence, we discern that female directors are included in the board not only for fulfillment of stated quotas, but also for their demonstration of due diligence to restrain management from earnings management practices.*

Keywords: *Female director, Real earnings management, IT friendly firms, Corporate governance*

I. INTRODUCTION

Existing literature on firms' performance and board diversity validates on the broad view that presence of female on the board increases firm's performance (Adams & Ferreira, 2009). Females on the board are represented at a much lower proportion compare to male. Davies (2011) documents that the level of under-representation of the female on the corporate board in all over the world, ranging from the lowest of 3.6% in Asia-Pacific to the highest of 23% in Sweden whereas in Bangladesh is the rate stands at 14%. There exists widely held concerns for balanced gender representation on the corporate board. Previous study finds mixed evidence regarding the contribution of female board member on ensuring financial transparency through restraining management from earnings management practices (Arun, Almahrog, & Aribi, 2015). World Bank (2007) note that there is a dominant presence of family ownership or inside ownership in Bangladesh. The presence of inside or concentrated ownership may try to appropriate the interest of minority shareholder(s).

Revised Manuscript Received on October 30, 2019.

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In this environment, agency problem type II (conflict between majority and minority equity holders) is more serious than problem type I (Conflict between principal and agent). Bangladesh Securities and Exchange Commission (BSEC) issued revised corporate governance (CG) guideline in 2012 to protect the interest of minority shareholders as well as to ensure accountability and transparency. Revised CG guidelines comprises of two areas, board composition and activities, as well as external auditor's role and activities. In case of board composition, researchers have focused on the association between firm performance and gender diversity on the board (Marinova, Plantenga, & Remery, 2016). Bangladesh government gives top most priority in information technology. In their election manifesto, they gave commitment to give all services using latest technology to ensure the transparency. Government think that, by digitalization of all services, they will be capable to reduce corruption (Muhit, 2018).

Barber & Odean (2001) document that women are less likely to risk-taker than men. They are more cautioned and more defensive than males in different approaches of decision making process. Moreover, Women are more likely to avoid risky environment where uncertainty and changes are regular phenomenon (Powell & Ansic, 1997). Information technology friendly firms also give an interesting case for studying behavior of female directors to manage the practice of real earnings management (REM), as this firms are characterized by new challenges, future uncertainties and frequent changes. Since, a significant investment is required for Enterprise Resource Planning (ERP), A firm will adopt ERP system, if they need this technology and they have interest on IT. In our study, we consider a firm as an IT friendly firm if this firm has adopted Enterprise Resource Planning system. In our study, we analyze the association between REM and female directorship in IT friendly firms that are listed in Dhaka Stock Exchange (DSE). This study finds that female director in IT firms are more capable compare with non-IT firms and male director to reduce REM. This findings is consistent with (Byrnes, Miller, & Schafer, 1999) previous result. On the other hand, Female directors of all listed Bangladeshi firms are not capable or willing to restrain the practices of REM. Moreover, this analysis documents that Bangladeshi IT friendly firms are less likely to involve in REM compare to non-IT friendly firms. The rest of the paper is presented as follows. Review the existing literature and develops the hypotheses in section 2, the relevant research methodology discuss in section 3, section 4 explains the analyses and results and section 5 summarizes the major findings.



II. EARNINGS MANAGEMENT

A. Earnings management and gender diversity on the board in IT friendly firms

Women tend to be more compliant to ethics in their work place and more likely to communicate incidents of fraud and irregularities of the financial statements (Kaplan, Pany, Samuels, & Zhang, 2009). Previous studies also revealed that women are less prone to involve in opportunistic activities while making organizational decisions and they also attach lower importance on up streaming personal interests (Krishnan & Parsons, 2008). Moreover, they are less likely to take risk than men and they are more cautioned and more defensive than males in different policy making process (Byrnes et al., 1999). They are also incline to behave more definitively compare to man in order to increase financial reporting quality since they are tend to be situationally aware to loss of reputation and the risk of lawsuits. Similarly, Krishnan & Parsons (2008) document that number of female director and earnings quality is positively associated.

Gull et al. (2017) raise the issue of demographic and statutory characteristics of female directors and see the impact of them on REM. They argue that, if female directors are appointed on the board only to fulfill the female quotas, then it will not assist in reducing earnings management. Moreover, they mentioned that personal attributes play a greater role towards restraint earnings management. For example, they stated that membership of audit committee and business experience are main features of female directors which stimulate the monitoring of earnings management (EM). They concur that female's experience and leadership are positively associated with EM. However, in contrast, Sun, Liu, & Lan (2011) get no association between EM and female representation on audit committees. Likewise, Peni & Vahamaa (2010) report no statistical relation between EM and female representation on the board. In light of the divergent opinions, we examine the association between REM and presence of female directors on board of IT friendly firms in Bangladesh. We test presence of female directors and number of female director(s) on the board with real earnings management. We present hypothesize in alternative forms. Morris & Laksmana (2010) find ERP adopter firms shows lower discretionary accrual than ERP non-adopter firms. Moreover, they mentioned that ERP system should provide greater transparency and accountability and deliver better quality report by limiting opportunistic activities of management.

H1: The level of the REM is lower in IT friendly firms.

To test H1, the study used the following model:

$$REM_{it} = \alpha_0 + \alpha_1 IT_F + \alpha_2 CONT + \sum \text{Industry Year Fixed Effect} + \varepsilon_{it}$$

H2: The negative association between REM and IT friendly firms is more pronounce if the board includes a female director.

$$REM_{it} = \alpha_0 + \alpha_1 INTER + \alpha_2 CONT + \sum \text{Industry Year Fixed Effect} + \varepsilon_{it}$$

Where REM_{it} is real earnings management, measured by management's real activities for firms i at time t . IT_F stands for IT

friendly firms. $INTER$ stand for interaction value of two dummy variables $\{IT_F$ and BD_FEM (BD_FEM stands for presence of female director)}. $CONT$ depicts control variables and ε_{it} is the usual error term. Similar to Razaque et al. (2016) all models of our study have been estimated via a two-dimensional industry year fixed effect to account for the overlooked group heterogeneity.

III. RESEARCH METHODOLOGY

A. Data and methodology

From 2000 to 2005, no corporate governance (CG) guideline for all listed firms were existent to be followed. In 2006, BSEC issued voluntary CG guideline for listed firms. Again in 2012, BSEC issued revised CG guideline for listed firms to follow (BSEC, 2012). Our study utilizes a large data set ranging over an eighteen-year period from 2000 to 2017 and sample size is 1914 firm years. In our study, if the firms are from IT industry or the firm(s) invested a substantial amount of money in IT area, we consider then as an IT friendly firms. A significant amount of investment is required to implement ERP system. O'Leary, (2000) documents that average implementation cost of ERP system is \$15 million, sold by top vendors like Oracle, SAP and AG. So, we include all IT firms and the firms which implemented ERP software in our study as an IT friendly firms. We collect a sample of ERP system implementation firms to test hypothesis through direct communication with all listed companies in Dhaka Stock Exchange (DSE). We use a dummy variable for IT friendly firm. This variable encoded with the value one if the firms are IT friendly firms, zero otherwise. We employ another dummy variable, if board appoints female director(s), coded with one, zero otherwise. We take interaction value of these two dummy variable (IT firms and female board member) to test the hypothesis.

Following previous studies on EM, (Cohen & Zarowin, 2010; Roychowdhury, 2006), our study excludes all financial companies from the sample. As an electronic database of public listed companies is not available in Bangladesh, we employ primary data encoded manually. The main sources of data include company annual report, prospectus, different public issue offer documents, and monthly review of Dhaka Stock Exchange. We perform panel data analysis for this study for of its capability to separate the effects of specific interventions and treatments both across cross-sections and time (Hsiao, 2003). Moreover it provides valid control over unobserved effects due to omitted variable bias. Table 1 and 2 charts the number of observation conferring to each year and each industry respectively.

B. Research Design

C. Dependent Variable: Real earnings management

Roychowdhury (2006) document that companies apply numerous REM tools to achieve target financial outcome. Graham et al. (2005) argue that top executives love REM compared to accrual-based EM. Moreover, they document that 80% of Chief Financial Officers (CFOs) mentioned, they show a reduced amount of research and development expenses to report higher levels of profit and 55% responded that they would be disinclined to initiate a new project to reach target profit.

Similar to Roychowdhury's (2006) proxies, to measure real activities manipulations, we choose abnormal operating cash flows, abnormal production costs and abnormal discretionary expenses. Following Roychowdhury (2006), several studies investigate the REM activities by employing the same proxies (Cohen & Zarowin, 2010) to increase the empirical rationality of these proxies. We apply three methods to examine the impact on the three variables mentioned above. We use Dechow, Kothari, & Watts (1998) model as applied by Roychowdhury (2006) to generate a standard or normal level of cash flow from operation (CFO), cost of production and discretionary expenses.

Abnormal cash flows from operation (AB_CFO): By offering further sales discount and soft credit period, firms can increase sales for a short period of time. These soft credit period and sales discount will improve current year earnings, assuming that firms' gross margin ratio is positive. Actual cash flows will be lower than normal level cash flows. Abnormal cash is measured as the difference between actual operating cash flow and normal level cash flows from operation. According to Roychowdhury (2006), We measure normal CFO as a function of sales revenue and change in sales revenue and estimate standard level operating cash flow by following a cross-sectional regression model. This model is employed for each industry and each year.

$$\frac{CFO_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{it}}{Assets_{i,t-1}} + k_3 \frac{\Delta Sales_{it}}{Assets_{i,t-1}} + \varepsilon_{it}$$

Where: CFO_{it} = Cash flow from operation during the period for firms i and time t ; $Assets_t$ = Value of total asset at year t ; $Sales_t$ = value of sales for t ; and $\Delta Sales_t$ = difference in sales between $Sales_t - Sales_{t-1}$.

Abnormal production cost (AB_PROD): By producing more volume, management can spread the fixed cost per unit, thus lowering per unit cost. Firms can report the lower cost of goods sold and higher operating margin. Due to operating at the level of additional production, production cost will be unusually more than normal production cost. According (Cohen & Zarowin, 2010), following cross-sectional regression, we will estimate production for normal level.

$$\frac{Prod_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{it}}{Assets_{i,t-1}} + k_3 \frac{\Delta Sales_{it}}{Assets_{i,t-1}} + k_4 \frac{\Delta Sales_{it-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$

Where: $Prod_t$ = Production cost for the year t . We compute that by adding changes in inventory with the cost of goods sold. All other variables are defined above.

Abnormal discretionary expenses (AB_DIS): Firms may report lower discretionary expenses, which include administrative expenses, advertising expenses, research and development expenses, and selling expense, in order to enhance current year earnings. Hence, firms are reporting lower amount of discretionary expenses than actual expenses. Similarly, abnormal discretionary expenses are the difference between actual and normal level discretionary expenses. We measure a normal level of discretionary

expenses by following regression according to Roychowdhury (2006),

$$\frac{Disexp_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{it}}{Assets_{i,t-1}} + \varepsilon_{it}$$

When we measure discretionary expenses using current year sales, it may exert a significant effect on residual of the equation. To measure this, this study deploys previous year sales to measure discretionary expenses.

$$\frac{Disexp_{it}}{Assets_{i,t-1}} = k_{1t} \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$

Where: $Disexp_t$ = discretionary expense for the period of t . Combined value of research and development, advertising, and selling and administrative expenses are considered to measure discretionary expenses. Other variables are defined as in the previous setting. To control for heteroscedasticity, all variables are scaled by prior year asset ($Assets_{i,t-1}$) in all three previous equations.

The abnormal CFO, abnormal discretionary expenses and abnormal cost of production are measured as the difference between the predicted normal levels cost from the above models and actual values. As proxies of REMs, we use these three variables in our study. If a company wants to show a higher profit by real earnings management for a specific level of sales, they will try to act upon one or all of these simultaneously. For the sake of simplicity, we multiply irregular cash flow and discretionary expenses by minus one to reorganize all three variables in the same direction. A positive value indicates earnings management through lowering cash flow and discretionary expense, and overproduction. In order to measure Real earnings management proxies (REM_PROXY), we take sum of the values of AB_CFO, AB_DIS and AB_PROD.

D Independent variable

We plan to test the relationship between female directorships in IT friendly firms and REM and hence, female directorship and IT friendly firms are our independent variable. We also take the interaction value (between female director and IT Friendly firms) as another independent variable to see the effectiveness of female directorship in IT friendly firms to restrain earnings management. Annual reports of listed firms of DSE presents the name of director with their pictures respectively. In our study, we test two hypotheses. Firstly, we see the association between IT friendly firms and REM. We employ a dummy variable to accomplish this. If the firm is IT friendly, coded with one, zero otherwise. Secondly, we test the relationship between female directorships in IT friendly firms and REM. We take another dummy variable to do this. If the board appoints female director(s), coded with one, zero otherwise. We get interaction value between two dummy variable (IT friendly firms and female director).

Sample of firm-years, by year and industry

Table 1: by Year

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Number of listed firms	92	97	91	105	110	101	106	117	123	123	129	131	138	133	137	137	116	118	2104
annual reports are not available	10	18	9	16	7	7	6	7	17	16	15	16	5	14	5	13		3	190
Final sample	82	79	82	89	103	94	100	110	106	107	114	115	133	119	132	124	112	115	1914

Table 2: by Industry

Industry	Engineering	Food	Fuel & Power	Jute	Textile	Pharmaceutical	Paper & Printing	Service & Real estate	Travel and leisure	Cement	IT-Sector	Tannery	Ceramic	Telecommunication	Miscellaneous	Total
Number of listed firms	341	226	166	51	434	305	19	47	30	99	86	88	67	14	131	2104
annual reports are not available	36	35	18	2	37	26	1	3	2	15	5	3	2	0	5	190
Final sample	305	191	148	49	397	279	18	44	28	84	81	85	65	14	126	1914

E. Control variable

Several control variables as suggested by prior REMs and CG literature. This study applies several control variables for analyzing firm-specific attributes which may influence the level of REM. Following existing literature, to consider risk of bankruptcy as a control variables, we include LEV and LOSS. This study also includes SIZE, AGE and BD_SIZE as a control variable. LEV is calculated as the proportion of total debts to total asset, LOSS is a dummy variable coded with one if the firm report loss, zero otherwise. Natural logarithm of total asset has been taken as a SIZE and AGE is measured by natural logarithm of total age of the firms. BD_SIZE is measured as a number of board members.

IV. RESULT AND DISCUSSION

A. Descriptive statistics: Descriptive statistics of all variables are presented in Table 3. On average, the sample firms possess a negative REM.

It indicates that on average Bangladeshi firms incline to be defensive and they are involved in income decreasing REM indeed. Table shows that 14% of director are female for the sample firms. Compared to other countries, it is 10.72 percent in France (Gull et al., 2017). I also find that average number of female director is 0.99 and maximum number is 5. These results are not inconsistent with the prior findings of (Gavious, Segev, & Yosef, 2012) and they find that average number of female director in Israeli firms and the maximum female board members is 5. Similarly, Arun, Almahrog, & Aribi (2015) document that average number of female board member is 1 and maximum female directors is 4. Among the control variables, LEV is 57 percent which is near to what is reported by Hsu & Koh (2005), near about 54 percent. In comparison to other developing countries, it is 36 percent in Jordan and 34 percent in China.

Table: 3

Variable	N	Mean	S.D.	Quantiles				
				Min	.25	Mdn	.75	Max
REM	1914	-0.00	0.21	-1.10	-0.09	-0.00	0.09	0.83
REM1	1914	0.00	0.11	-0.50	-0.05	0.00	0.06	0.39
REM2	1914	-0.01	0.18	-0.85	-0.07	0.00	0.07	0.71
AB_CFO	1914	0.00	0.08	-0.26	-0.04	0.00	0.04	0.24
AB_DIS	1914	-0.00	0.07	-0.24	-0.02	0.00	0.03	0.19
AB_PROD	1914	-0.01	0.15	-0.61	-0.05	0.00	0.04	0.52
INTER	1914	0.12	0.33	0.00	0.00	0.00	0.00	1
BD_FEMNO	1914	0.99	1.07	0.00	0.00	1.00	2.00	5.00
BD_FEMPRO	1914	0.14	0.15	0.00	0.00	0.13	0.25	0.75
LEV	1914	0.59	0.42	0.04	0.36	0.55	0.73	3.40
SIZE	1914	20.96	1.66	17.34	19.76	20.78	22.04	25.41
AGE	1914	2.48	0.89	0.00	1.95	2.77	3.14	3.66
LOSS	1914	0.14	0.34	0.00	0.00	0.00	0.00	1

GROW	2195	0.17	0.65	-0.64	-0.18	0.01	0.30	3.38
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Where REM is real earning management; AB_CFO is the abnormal cash flows from operations; AB_DIS is the abnormal discretionary expenses; AB_PROD is the abnormal production costs; REM_1 is the aggregate of AB_CFO and AB_DIS; REM_2 is the aggregate of AB_PROD and AB_DIS; BD_FEMNO is number of female on the board; BD_FEMPRO stands for proportion of female on the board; INTER is the interaction value of two dummy variables (BD_FEM and IT friendly firms); LEV stands for the ratio of current total debt to current total asset of time period; GROW represents the current-period growth rate of sales; ROA proxies for the ratio of current-period net earnings to current-period total assets; LOSS is used a limited dependent variable encoded with one when the firm experienced a loss in the preceding year, zero otherwise.

B. Correlation matrix

Table 4 shows the correlation among different variables of my study. We find a positive relationship of REMs proxies with presence and proportion of female director and this association is statistically significant ($p < 0.01$). On the other hand, an inverse association exists between REMs proxies and the IT friendly firms and also statistically significant ($p < 0.01$). REMs proxies are negatively associated with two control variables (AGE, SIZE). Moreover, this study finds that REMs proxies are positively associated with other two control variables (LEV and LOSS). Table 4 presents that the maximum level of correlation was reported to exist between the independent variable of our study with a coefficient of 38% and significant at 1% level. Since the value of the coefficient is less than 80%, therefore, in our analysis, the multicollinearity problem is not prevalent between the independent variables (Gujarati, 2003, p.359).

Table: 4 Pearson correlation

Variable	REM	REM1	REM2	AB_CFO	AB_DIS	AB_PROD	IT_F	BD_FEMALE	INTER	LEV	SIZE	AGE	LOSS
REM	1.00												
REM1	0.72**	1.00											
REM2	0.93***	0.49***	1.00										
AB_CFO	0.52**	0.79***	0.16***	1.00									
AB_DIS	0.55***	0.67***	0.60***	0.08***	1.00								
AB_PROD	0.87***	0.29***	0.93***	0.16***	0.28***	1.00							
IT_F	-0.19***	-0.19***	-0.17***	-0.10***	-0.18***	-0.13***	1.00						
BD_FEMALE	0.07***	0.08***	0.05**	0.07***	0.04*	0.05**	-0.18***	1.00					
INTER	-0.08***	-0.06**	-0.08***	-0.03	-0.06**	-0.08***	0.58***	0.33***	1.00				
LEV	0.11***	0.13***	0.04	0.20***	-0.02	0.05*	-0.0362	-0.11***	-0.04*	1.00			
SIZE	-0.02	-0.00	-0.01	-0.02	0.012	-0.02	0.31***	0.01	0.24***	-0.15***	1.00		
AGE	-0.04	-0.04	-0.06**	0.03	-0.11***	-0.02	0.04*	-0.04	-0.02	0.19***	-0.11***	1.00	
LOSS	0.09***	0.12***	0.03	0.16***	-0.00	0.04*	-0.11***	-0.10***	-0.08***	0.38***	-0.18***	0.08***	1.00

Where IT_F is a dummy variable coded with the value one if the firm is IT friendly, zero otherwise; BD_FEM is also a dummy variable coded with the value one if the board

appoints female director, zero otherwise. Other variables are defined previously. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

C. Regression result

Table 5 reports regression analysis of cross-sectional time series with time and firms specific fixed effect. The adjusted



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R^2 of our estimated models is rather low. Previous studies also document that the low value of adjusted R^2 are not atypical in case of REM. Table 5 presents the regression output, to uncover the statistical association between prevalence of female directors in IT friendly firms and real earnings management. Model 1 shows that IT friendly companies are less likely to involve in REM compare to non-IT friendly firms, where REM is significant at $p < 0.01$ and t values are -8.11. This findings is matching with the prior findings (Gavious et al., 2012). Model 2 reports that female director of Bangladeshi firms are positively related with REM, where REM is significant at $p < 0.01$ and t values are 3.56. They are not effective to limit REM practices of management. This outcome is consistent with (Byrnes et al., 1999) previous result. Female directors of Bangladeshi are not capable or willing to restrain the practices of REM. We

also test the impact of female director in IT firms with non-IT firms and male director to reduce earnings management in model 3. This study document that female director(s) of IT friendly firms are more capable to restraint management from earnings management practices. They are not coming on the board only to fulfill the quota rather they show their due diligence to ensure the transparency and accountability.

V. CONCLUSION

In our study, we investigate the relationship between the persistence of female directorship of IT friendly firm and REM employing a sample of Bangladeshi public listed firms on the Dhaka Stock Exchange during the period 2000-2017.

Table:5

VARIABLES	1 REM	2 REM	3 REM
IT_F	-0.106*** [-8.11]		
BD_FEM		0.037*** [3.56]	
INTER			-0.058*** [-3.55]
BD_SIZE	-0.001 [-0.46]	-0.002 [-0.93]	-0.000 [-0.20]
LEV	0.067*** [3.41]	0.073*** [3.67]	0.072*** [3.61]
SIZE	0.008** [2.25]	-0.002 [-0.54]	-0.001 [-0.36]
AGE	-0.009 [-1.39]	-0.015** [-2.32]	-0.015** [-2.47]
Losses	0.041*** [3.00]	0.048*** [3.51]	0.042*** [3.05]
Constant	-0.139* [-1.79]	0.015 [0.20]	0.022 [0.30]
Observations	1,910	1,910	1,910
R-squared	0.07	0.04	0.04
Adj. R-squared	0.06	0.02	0.02

In our analysis, we find presence of female directors of IT friendly firms are negatively associated with real earnings management. These findings indicate that the listed IT friendly firms of Bangladesh which appoint female director on their board are not more likely to be involved in REM. This study underscores that non IT friendly firms with female directors involve real earnings management through low or minimal price discount, tight credit facility and reduced production cost. In addition, we find that all Bangladeshi listed firms with female directors exhibit more income-decreasing earnings. This can be argued that presence of female directorship may solve the problem of income increasing real earnings management through their conservative attitude towards this setting of decision making. Moreover, this study find that IT friendly firms are less involved in earnings management compare to non IT friendly firms. Our result is also consistent with previous result (Gavious et al., 2012).

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