Impact of Female Director on Firm Performance in Emerging Economy

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Abstract: This study examines the impact of female director on the firm market based financial performance of listed Indian firms in an econometric modelling approach. Using a firm year unit of analysis, a sample of 60 BSE listed companies across various industries has been studied over a period of twelve financial years, namely FY 2006–2007 to FY 2017–2018. Using panel data analysis, the percentage of female directors on corporate board is taken as the independent variable and firm performance measured by two market based financial performance indicator Q (Tobin's Q) and Mv/Ev (Market Value to Enterprise value, as the dependent variables. The primary results of the study using panel least squares (PLS) and random effects (RE) estimation models point towards a positive and significant correlation between the percentage of female directors and Tobin q. However, results are found to be more strong when Mv/Ev been used as firm financial performance. The findings of the study indicate that the number of companies with no female directors is reducing across the 12 years of study. It may be due to the external pressure created by the new corporate governance code 2013, also, the number of companies with one or more, number of female directors been seen as increasing during the period of study. Still, very few companies can be seen keeping one-third of the director as female director; this could be due to the non-availability of a female director.

Index Terms: BSE, Corporate Governance, Female Director, Financial Performance, Indian Listed Firm, Panel data econometrics, Companies Act 2013.

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1. INTRODUCTION

This research paper comes at a time when the board's political debate is gaining momentum to promote female directors on the board. Listed companies in India now have to comply with the requirement to name at least one female to their boards. In this context, whether the impact of a female director on boards on firm performance becomes an important research issue, something that has yielded mixed results in a global context. Examining this link requires an empirical investigation in the Indian context, in which the existing literature provides little insight into the subject. Internal or external to the organization or gender diversity (Pearce and Zahra 1991). This study is attempting to understand the inter-linkage between the female director and firm performance and it is hoped that the Indian boards will provide useful insights into whether a business case exists for women. In the backdrop of unique business practices, institutional infrastructure, and traditionally male-dominated society, Existing literature holds very few studies on this subject and is rare to find in an emerging economy like India and to the best of the author's knowledge; this is one of few papers related to women director and their impact on firm's performance in the Indian context. Q ratio (Tobin q) is calculated by the market value of the company divided by company's asset replacement cost; it can be interpreted that q expresses the relationship between company's extrinsic value and its intrinsic value; thus, it is a mean for estimating whether a particular company is undervalued or overvalued (Kaldor 1966). Though Tobin q has been used widely in studies for countries with a well developed and regulated stock market, it may not be appropriate to use it in the Indian context. Reason been market value of company is highly volatile because of great variation temporarily in risk and liquidity, and for replacement cost of asset cannot be found as emerging

economy tend to have high inflation, However in Indian economy final reports of company contain assets on historical cost method and not replacement cost method, as in the case of USA. Hence researcher of this study came up with new tool Mv/Ev (replacement of Tobin q), which can be better used in an emerging economy for the studies. This study includes both market-based financial performance q (Tobin's q) and Mv/Ev (Market value to Enterprise value, to show the variation in the result. This study used a sample of 60 listed non-financial companies of Bombay Stock Exchange (BSE) India from 2007 to 2018. Estimated results indicate that the female director has a positive impact on firm performance Q but found to be significantly positive and with better r-square in the context of Market value to Enterprise value.

2 LITERATURE REVIEW

The role of board of directors is a widely studied topic (Larcker and Tayan 2011), and role of female director among board of director emerges as an essential element in this framework (Francoeur et al. 2008) with research into the role of women on boards gaining currency (Terjesen, Sealy, and Singh 2009; Adams and Ferreira 2009). Boards form an essential element in the internal discipline of corporate governance mechanisms. The OECD defines corporate governance as a system that assigns rights and responsibilities to various participants, such as board members, managers, and investors, and prescribes rules/procedures for corporate decision-making (OECD 2004). The theory of the organization provides the theoretical basis for integrating governance in the role of boards. Based on this view, the question of corporate governance starts with the division of ownership and control, creating a conflict of interest between the owner and manager. Proper oversight of managers is, therefore, supported, either through management or investor control (Fama and Jensen 1983). The primary duty of the board of directors is to take into consideration shareholders' interest and stakeholder interest while making business decisions, thus increasing shareholder value and firm value (Yadav and Chakraborty 2016). Empirically, studies have shown that the more female director on board leads to better monitoring of managers. Hence, higher women's presence at the corporate board increases board independence. (Carter et al. N.K. Sanan 2007).

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According to Stanwick and Stanwick (2010), when the board of directors are made more accountable for their decision and work, it improves the financial performance of companies. The specific issue of the relationship between the presence of women on the board and firm performance has produced inconclusive results (Carter et al. 2003). Pearce and Zahra (1991), their work on whether and how boards with female directors differ from a board with only male members, posits that a representation of diverse interests, including the number of females, is an essential characteristic of an effective board. Research establishes that women director representation on boards bring varied perspectives to decision making (Campbell and Mınguez-Vera 2008; Smith et al. 2006). As Bilimoria (2000) suggests, women directors enhance the boardroom discussions given that fact they possess better listening skills and are more sensitive towards others. This increased quality of board room interaction improves decision making, which leads to improved firm performance (Catalyst 2004). Erhardt et al. (2003) found the presence of female directors at corporate boards influence positively to firm accounting performance for a giant firm in a developed economy. However, there are studies which find existing opinions on the effect of a female director on corporate boards on firm performance as being different and lacking obscurity (Dobbin and Jung 2011). Studies conducted over a long period find no relationship between the two (Farrell and Hersch 2005; Bonn et al. 2004). Studies that show a positive relationship suffer from the problem of endogeneity i.e., endogeneity refers to those factors which are not known but have an effect on female director and firm performance. Farrell and Hersch (2005) conclude that women on the board result in neither creation nor destruction of value. Some studies find that the presence of women on the corporate board has adverse impacts on the board's decision-making process (Bohren and Strom 2007; Adams and Ferreira 2009) due to increased conflict and lack of cohesion. Table 1 shows summarised studies that have documented positive, negative or no relationship between female directors and firm performance. Studies mentioned above use data from developed economies. India, with its background of a traditionally male-dominated society, provides a unique setting to examine board gender issues. India, with its history of a male-dominated society, provides a unique environment to discuss gender diversity issues in the corporate board on the table.

Table1. *Relationship between female director and firm performance studies*

Author	Country	Year	Sample Size	Dependent Variable	Independent Variable	Result
Farell & Hench	USA	2005	1000 Firm	Female director added	Gender diversity	No link
Bolren & Strom	Norway	2007	203 non financial firm	Financial performance	Female director	Negative
Cambell & Vera	Spain	2008	68 non financial firm	Tobin q	Female director	Positive
Adam and Ferreira	USA	2009	1939 US firm	Firm Characteristics	Board Characteristics	Negative
Gul, Srinidhi &Ng	USA	2011	7597 firms year	Stock prices	Gender diversity	Positive
Alharand Dittnar	Norway	2012	248 Norwegian public ltd	Firm Performance	Women's ratio	Negative
Erhardt et al.	USA	2003	112 firm	Firm performance	Women director	Positive
Smith et al.	Denmark	2005	2500 firm	Firm Performance	Women director	Positive

Source-Sanan 2016

3 OBJECTIVE

To examine the impact of female director on the firm performance

4 DATA AND METHODOLOGY

Data Collection and Period of Study

The effect of presence of women director on the performance of BSE 500 listed companies in India been examined, using the period of a 12-year study (2007-2018). The data will be analyzed using the following performance indicator, i.e., Q (Tobin q) and Mv/Ev (Market value to enterprise value. After going through a detailed study for sample selection from BSE 500 listed companies, excluding financial and banking companies and also companies whose data were unavailable. Final population shrink to 304 companies. Finally, sample selection was made by random selection with the help of SPSS.20, 60 companies been taken from the pool of 304 companies The Women director served as the base of this study; this study will use Women director as independent variables (Women director - Percentage of female director on

the company board). Two dependent variable (Tobin q and Market value to enterprise value, and lastly five control variables .i.e. Firm Size – Natural log value of total assets, Firm Age – Number of year since incorporation, Financial Leverage- Liabilities to book value, Operating Performance-Net profit to Total Income and Cash flow. The cash flows will be 'log' on its amount before taken for analysis to minimize the cash flow volatility among each focussed and diversified company. The descriptive analysis will determine the maximum, minimum, standard deviation, and means on focussed companies' performance. The following is the regression models constructed for the study:

Performance = $\beta_0 + \beta_1 FD + \beta FA + \beta_3 FS + \beta_4 LV + \beta_5 OP + \beta_6 CF$

Panel Data Analysis
Panel data analysis describes the individual variable behaviour both across the time and across other variables. Panel data has three approaches for its estimation i.e., Pooled regression model, fixed effect model, and the random variable model. The fixed-effect model analyzes the impact of the variable that varies over time; all time-invariant characteristics are unique to individuals and should not be correlated with other individual characteristics. In the random effect model, the variation across individuals is assumed to be random and uncorrelated with predictor or independent variables, which are included in the regression model. Female director as independent variables will be examined using the Hausman test; this test is applied for the purpose of identifying the relationship between the predictor variable and outcome variable within the sample companies is fixed or random. If p-value is less than 0.05 significance values, then the model will be a fixed-effect model, while p-value greater than 0.05 significance value, then the model will be random variable model. Ordinary least square (OLS-PLS) has been used in analysing the panel data regression analysis and explained the variation in dependent variable (Q and Mv/Ev) caused due to variation in predictor variable (female director, firm age firm size, leverage operating performance and cash flow), in other word OLS-PLS estimate the relationship between the dependent variables and independent variable or predictor variables.

5 RESULT AND ANALYSIS

Table-2: Descriptive Result (2007-2018)

	Mean	Median	Max	Min	SD
FD%	7.11	7.69	33.33	0.00	6.91
FD-Dicoto	0.60	1.00	1.00	0.00	0.49
FA	1.58	1.58	2.06	0.85	0.24
FS	10.39	10.29	16.55	5.55	1.45
LV	0.54	0.55	2.16	-0.44	0.26
OP	0.11	0.08	3.83	-0.35	0.17
CF	0.19	0.17	0.94	0.00	0.11
M_MV_EV	0.68	0.74	4.38	-3.64	0.35
M_Q	2.30	1.72	11.01	0.29	1.75

Researcher Calculation
The above table shows that the ratio of average female directors' presence in sample companies is 7% percent.

However with 60 percent of companies have now given place to female position on its corporate board; this changes been seen due to changes in companies act 2013, where it is now mandatory for companies to place at least one female director in the board of directors. Most of the companies in India have, on average, 11 directors with some exceptions where the number of directors is equal to 26 or more. A total of 720 firm-year observations have been included in the sample for the estimation of results. In the sample, Tobin q mean value is 2.3 while the maximum is 11.01, and the minimum is 0.29. While market value to enterprise value mean value is 0.68 and a maximum 4.38 and minimum -3.64. The firm's age has been taken as a log value of age where it found to be mean 1.58, which indicates on average age of firm for the sample is 38 years, maximum age and minimum age being 115 years and 07years. Firm size has been calculated as a log of total assets, average firm size Rs 24547 million. Leverage has been calculated by Liabilities to book value, where the researcher found average financial Leverage found across the company is 0.54, maximum was 2.16, and the minimum was -0.44, Leverage of -0.44 indicates that this firm has invested their extra fund in other companies. Average operating performance was found to be 0.11, a maximum of 3.83 and a minimum -0.35. Cash flow in this sample study found to be0.19 average and maximum 0.94 and minimum 0.00. The presence of female directors at the corporate board was measured by the percentage of women directors. The percentage of women directors was calculated by the number of women directors divided by board size. For the given sample across years of study, the average percentage of women directors was 7.11 %. The maximum percentage of women directors was 33.33%, while there were boards with no women directors across the period of study. This is in line with that study indicated by the Catalyst Survey of 2011 (5.3 %). The highest percentage of women directors was 30.7 % while there also exist boards with no women directors.

Correlation Matrix

Table 3 Correlation table (2007-2018)

S. No.		1	2	3	4	5	6	7	8	9
1	FD%	1.0000								
2	FD-Dicoto	0.7963	1.0000							
3	FA	0.0114	0.0216	1.0000						

4	FS	0.0667	0.1411	0.3556	1.0000				
5	CF	-0.0120	0.0016	-0.0279	-0.2000	1.0000			
6	LV	-0.1088	-0.1037	-0.0009	0.2593	-0.1432	1.0000		
7	OP	0.0290	0.0152	-0.0014	-0.0765	0.2793	-0.2880	1.0000	
8	M_MV_EV	0.0668	0.0901	0.0328	-0.2309	0.2974	-0.4595	0.2684	1.0000
9	M_Q	0.0931	0.1164	0.0604	-0.0445	0.3832	-0.0512	0.1089	0.3958	1.0000

Researcher Calculation

Table 4 *Panel data Analysis- Q (2007-2018)*

Variable	Model 1 Q (PLS)	Model 2 Q (PLS-RE)
C	-0.0535	-0.6145
FD	0.0259*	0.0171*
FA	0.3699	0.0266*
FS	0.0518	0.1859*
LV	0.0858	0.4132
OP	-0.0909	-0.2133
CF	6.4255*	4.7113*
R-squared	0.1829	0.1200
Adjusted R sq	0.1655	0.1050
Durbin-Watson stat	0.4900	1.0700
F-statistic	10.5070	6.6200
Prob(F-statistic)	0.0000	0.0000
Hausman Test	0.1829	0.2838

*5% level of significance
(Researcher Calculation)

Table 4 *Collinearity diagnostics*

Variable	VIF	1/VIF
FD	3.3694	0.2968
FA	3.4453	0.2902
FS	1.1621	0.8605
LV	1.3366	0.7481
OP	1.1300	0.8850
CF	1.2008	0.8327

(Researcher Calculation)

A preliminary check to test for multicollinearity among independent variables is done by assessing the correlation between the firm performance and independent variables, taken one at a time. Going by Table 3, independent variables in the study are weakly correlated; none of them being more than 0.8. Hence, the problem of multicollinearity does not exist. A second check is done by using the variance inflation factor (VIF) according to which collinearity is considered a problem when VIF exceeds 10 (Neter et al. 1983). The VIF table (Table 4) also confirms the results of the correlation matrix, found to be below 10, and tolerances are below 1. This indicates that all predictor variables are highly independent and not affected or influenced by other predictor variables.

RESULT OF REGRESSION

Table 4 reports regressions of firm performance on female director presence on corporate boards. Panel least squares regression estimates are presented in Model 1. Results showed Panel least squares (PLS) coefficient estimate of the percentage of women directors is statistically significant and positive at 5 % level of significance, with adjusted r-square 16.55%, which indicates that predictor variable explains the variations of the dependent variable around 16.55%. Further, to address the concern that the percentage of women directors and financial performance are jointly determined by unobservable firm-specific variables, the random-effects model (RE) is employed. The RE method allows controlling of omitted variables in a panel data set (Wintoki and Yang 2007). Model 2 presents estimates once random effects are added. Results indicated that the coefficient estimate of the percentage of women directors remains statistically significant

and positive at 5 % level, thus robust to firm random effects. The economic significance of this result is that 1 % rise in the percentage of women directors increases Tobin q by 1.7 % by the RE method with adjusted r-square 10.50%. Coefficient estimates of age proxied by log (age), size proxied by log (assets) and cash flow proxied log (cash amount) are also significant at 5 %, positive for both PLS and RE models. This implies that firms would perform better, but not much difference can be expected. There is no other variable that is significant. However prior to this stationary test in data been checked through augmented dickey fuller-test (ADF-test) which

To choose between the PLS and RE methods, F test statistic with Tobin's q as the dependent variable exceeds corresponding critical value at 5 % level suggesting that pooled OLS be rejected. In order to decide between FE and random effects model, results of the Hausman test support random effects regression than random effects regression. Estimates of random effects model are depicted in Model 2.

Table-5 *Panel Data Analysis- Mv/Ev (2007-2018)*

	Model 3	Model 4
Variable	Mv/Ev (PLS)	Mv/Ev (PLS-RE)
C	0.8753*	0.9021*
FD	0.0220*	0.0102*
FA	0.1103*	0.1140*
FS	-0.0271*	-0.0261*
LV	-0.5142*	-0.5281*
OP	0.1795*	0.1815*
CF	0.6583*	0.5248*
R-squared	0.2946	0.2034
Adjusted R sq	0.2795	0.1865
Durbin-Watson stat	0.2795	2.2080
F-statistic	10.5070	6.6200
Prob(F-statistic)	0.0000	0.0000
Hausman Test	0.1829	0.2838

*5% level of significance

 (Researcher Calculation)

Table 5 reports regressions of firm performance on female director presence on corporate boards. Panel least squares regression estimates are presented in Model 3. Results reported showed Panel least squares (PLS) coefficient estimate of the percentage of women directors is statistically significant and positive at 5 % level of significance, with adjusted r-square 27.95%. To address the concern that the percentage of women directors and financial performance are jointly determined by unobservable firm-specific variables, the random-effects model (RE) is employed. Model 4 presents estimates once random effects are added. Results indicated

that the coefficient estimate of the percentage of women directors remains statistically significant and positive at 5 % level, with adjusted r-square 18.65%, thus robust to firm random effects. The economic significance of this result is that 1 % rise in the percentage of women directors increases Mv/Ev by 1.02 % by the RE method. Coefficient estimates of age proxied by log (age), size proxied by log (assets) and cash flow proxied log (cash amount) are also significant at 5 %, positive for both PLS and RE models. This implies that firms would perform better, but not much difference can be expected. There is no other variable that is significant. To choose between the PLS and RE methods, F test statistic with Mv/Ev as the dependent variable exceeds corresponding critical value at 5 % level, suggesting that pooled OLS be rejected. In order to decide between FE and random effects model, results of the Hausman test support random-effects regression than random effects regression. Estimates of the random effects model are depicted in Model 4.

6 DISCUSSION AND CONCLUSION

In this paper, we analyzed the effect of female directors on firm performance measuring factors like Tobin-q and Mv/Ev (Market value to Enterprise value). The finding of this study found to be consistent with previous literatures that if females are working as a director in the board of director in the firm, it will give the positive sign to the investors and leads the firm performance toward growth, the fact that they possess better-listening skills and are more sensitive towards others. As Catalyst (2004), Erhardt et al. (2003) proved that the presence of female directors at the corporate board shows improved quality of board room interaction and improved decision making, which leads to improved firm performance. The second finding is the number of companies with one woman director is increasing over the period of the study, while the number of companies with no women director still exist to 40 percent, over the 12 years of study. This finding provides useful guidance to corporations as scarcity in the labour supply market for women is a plausible explanation for the number of women directors not increasing at a higher pace over the years. The third finding of the study is that market measurement of financial performance tool Mv/Ev gave better results than Tobin q, which was developed for developed economy. Hence, this study provides literature with new tool Mv/Ev to be used as replacement of Tobin q in emerging economy research studies context. One of the few limitations of the study is that it covers only presence of women director on corporate board, however, relatives or husband of women's director on corporate board should also be explored, education levels, specific skill and experience should be also taken into consideration that they bring to the table. In reality, these parameters may play an important role.

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