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Board Diversity and Firm Performance Influenced by Ownership Concentration: Evidence from India

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Abstract: With the new Companies Act 2013 as well as Clause 49 of the listing agreement with stock exchanges in India mandating gender quota in the form of inclusion of at least one woman director in the board composition, the study on board diversity has assumed significant importance in the Indian context. Instead of limiting ourselves to gender diversity, we examine the various facets of diversity among the board of directors for a cross-sectional sample of listed firms in India and their association with the accounting and stock-based measures of firm performance as proxied by return on assets (ROA) and Tobin's Q respectively. We also explore if this relation is influenced by the ownership concentration in firms. We use three measures viz. Blau Index, Shannon Index and Coefficient of Variation for defining our diversity attributes based on gender, age, nationality, educational qualification, tenure and independence. Unlike several other research studies, we do not pool the various diversity scores to create a single diversity index as it has the potential to mask the actual association of each diversity attribute. We find that Tobin's Q is positively associated with international diversity suggesting that firms with higher proportion of international directors are considered favourably by investors than the ones with lower proportion. Moreover, firms where directors have repeat appointments increasing their tenure with the firms are valued less favourably by their investors. We also find that ROA is negatively associated with statutory diversity (board independence) which could possibly be attributed to over-monitoring in already well-governed firms. However, in our sample, we do not find significant difference in the association of board diversity with firm performance, contingent upon the ownership concentration or firm type (i.e. whether a firm is family firm or not based on our chosen definitions of a family firm).

Keywords: *Board diversity, corporate governance, firm performance*

1 Introduction

India had a functional and an active stock market since 1875 unlike most of the other developing nations, but with a virtually non-existent corporate governance structure with instances of inconsistent disclosure, ineffective boards and diversion of funds by insiders (in the form of owners diverting funds for private benefits) until late 1990's resulting in primary reliance on either internal or government funding for firms (Dharmapala & Khanna, 2011). Corporate governance reforms were introduced for listed companies in India to facilitate capital needs among other things with the promulgation of a new clause, Clause 49, of the listing agreement with Indian stock exchanges by Indian securities market regulator, Securities and Exchange Board of India (SEBI), in 2000 (Black, 2007). Since then the Clause 49 has been periodically revised to introduce new governance norms as well as to impose penalties for its non-compliance. The enactment of new companies act in August 2013 and its subsequent notification in March 2014 has further strengthened the corporate governance structure for all classes of companies in India and mandated among other provisions the inclusion of at least one woman director in the board composition[1]. This provision was subsequently also included in the revised Clause 49 to align it with the Companies Act 2013. Our study is motivated by this new provision in the Companies Act as well as in Clause 49 mandating minimum gender quota in India and its impact on the firm performance. Without limiting ourselves to gender diversity, we intend to explore the association of all major forms of board diversity in the Indian context with the measures of firm performance by examining a cross-sectional sample of listed firms.

The board of directors, often referred to as the board, is the highest decision making body in an organisation. Board structure, of which diversity is one of the important dimensions, has the potential to have a substantial influence on the board actions and thereby firm performance in line with the corporate governance theory (Carter, D'Souza, Simkins, & Simpson, 2010; Kim, Burns, & Prescott, 2009). Researchers view a corporate board from two perspectives viz. board as a group of diverse members and board as a single entity based on whether or not the director diversity (also known as director heterogeneity) plays a significant role in the functioning of a board (Ferreira, 2010). This study endorses the former stand and examines how board diversity is associated with the firm performance in emerging markets

[1] http://www.sebi.gov.in/cms/sebi_data/attachdocs/1397734478112.pdf

by presenting evidence from India and the role of ownership concentration therein. India as a country of interest for this study is important because of more reasons than one:

- India has a high incidence of family firms (highly concentrated firms in terms of ownership) which provides a unique setting for testing the role of ownership in relation between board diversity and firm performance.
- Most of the empirical research on board diversity is restricted to US and other developed nations. Recent research on this topic has also focused on some of the emerging markets. However, with each emerging market being unique in terms of economic, regulatory, political and institutional environments, the findings from one emerging economy may not hold for others.
- Since, the gender diversity has now been mandated on corporate boards in India as part of corporate governance regulations both through the companies act and listing agreement with stock exchanges, the research setting in the Indian context will help us know if there is a business case for mandating diversity.

Therefore, we explore through our research question if there are tangible benefits from mandating diversity on the boards of corporate India through a set of corporate governance norms.

2 Literature Review

Prior research on board diversity differentiates between its observable / demographic diversity comprising of gender, age, race and ethnicity and non-observable / cognitive diversity comprising of knowledge, education, values, perception and personality traits (Erhardt, Werbel, & Shrader, 2003). The research also differentiates between board's demographic diversity and statutory diversity by linking demographic diversity with culture, nationality, gender and experience of its directors and statutory diversity with mandate of law or best practices (Ben-Amar, Francoeur, Hafsi, & Labelle, 2013). Two important perspectives on the functioning of boards exist in the literature viz. agency perspective and resource dependence perspective (Ferreira, 2010). While statutory diversity assumes importance from the agency perspective which views that a board perform a monitoring role, demographic diversity is important from the resource dependence perspective which views that a board performs an advisory role and provides access to resources such as accessibility to key organizational stakeholders.

Board diversity comes with several costs and benefits. We briefly discuss some of these in the following sections.

2.1 Benefits of Board Diversity

Robinson & Dechant (1997) and Carter et al. (2003) list several benefits of increased boardroom diversity as given below:

- *Enhanced Creativity & Innovation:* Diverse groups foster creativity and innovation by considering a greater range of perspectives to problem solving. Groupthink problem is less prevalent in diverse groups. (Reference Needed –
- *Increased Market Penetration Ability:* Diversity helps to understand the marketplace comprising of a firm's potential customers and suppliers better and therefore enhances the market penetration ability.
- *Effective Problem-solving & Corporate Leadership:* Diversity promotes a variety of different perspectives which upon evaluation result in overall effective problem-solving in decision-making process and therefore improvement in the corporate leadership effectiveness.
- *Effective Global Relationships:* Diversity in culture promotes cross-cultural sensitivity for a global firm and therefore results in building global relationships.

2.2 Costs of Board Diversity

Literature enumerates some costs of board diversity as well.

- *Reduced Ability to Initiate Strategic Change during Environmental Turbulence:* During critical periods of environmental changes, proposals for strategic change intensify differences among diverse board and as such diverse boards are less likely to initiate strategic changes like service additions, divestitures and reorganisations than homogenous boards during periods of environmental turbulence (Goodstein, Gautam, & Boeker, 1994).
- *Adverse Impact of Factional Demographic Faultlines:* Demographic differences among the board members create factions called demographic faultlines which once activated (noticed by board members) and not curbed through reflection on board

functioning impact the board performance (Veltrop, Hermes, Postma, & de Haan, 2015).

2.3 Key Findings from Literature

The research on the diversity of the board has been one of the most prolific research topics in the literature in the last one decade. Most of the literature on studying board diversity centres around gender effects on boards. These studies do not take into account some of the other observable demographic aspects of diversity like age, education and functional experience. Several attempts to associate board diversity, especially gender diversity, with firm performance in literature report mixed / conflicting results, with some reporting positive association, some negative and some others no association (Miller & Triana, 2009).

The context of most of the studies remains confined to the US. In one of the first empirical studies on examining board diversity relationship with firm value, Carter et al. (2003) report positive association between board diversity as defined by the proportion of women or minorities and firm financial value as measured by Tobin's Q after controlling for firm size, industry and other governance measures for Fortune 1000 firms. In another study, Erhardt et al. (2003) find positive association between boardroom demographic diversity as measured by proportion of women and minorities on the board and firm financial performance as measured by ROA and ROI in a sample of large US firms. In yet another study, Adams & Ferreira (2009) examine the impact of boardroom gender diversity on firm performance in a sample of US firms and find that boards with high gender diversity allocate more effort to monitoring leading to the conclusion that gender diversity has positive association with performance in weakly governed firms owing to effective monitoring and negative association with strongly governed firms because of over-monitoring. There are some other studies in the US context which do not find either positive or negative link between board diversity and firm performance. Study by Carter et al. (2010) is one such attempt where they do not find any relation, either positive or negative, between boardroom gender or ethnic diversity and firm financial performance as measured by ROA and Tobin's Q for a sample of firms in S&P 500.

Literature lists several contributions to board diversity outside the US in the last one decade. Campbell & Mínguez-Vera (2008) investigate the relation between board-level gender diversity and firm financial performance proxied by Tobin's Q in Spain and find that boardroom gender diversity has a positive impact on firm value. Haslam et al. (2010) study the relationship between boardroom gender diversity and both accounting-based and stock-

based measures of performance for FTSE 100 firms listed on London Stock Exchange and report that boardroom gender diversity is not significantly related to accounting-based measures of performance (ROA & ROE) but negatively affects stock-based measure of performance (Tobin's Q). They also distinguish between accounting and stock-based measures of performance in the sense that accounting-based measures are largely objective (based on self-reported data conforming to accounting standards) and backward-looking (capture historical performance) and stock-based measures are subjective and forward-looking (influenced greatly by investor perceptions about future performance). Chapple & Humphrey (2013) study the economic impact of gender diversity of board of directors in a self-regulated environment by taking an aggregate / portfolio view of capital market financial performance in the Australian context and find no difference in the performance of gender-diverse and all-male board portfolios using one-factor model as well as four-factor model.

Several studies show a non-linear relation between board diversity and firm performance. Ben-Amar et al. (2013) examine the impact of demographic and statutory diversity on M&A performance in the Canadian context and find that demographic diversity as measured by culture, nationality, gender and experience of the board of directors has significant but complex and non-linear effect on M&A performance with effect being positive above a threshold and negative otherwise. They also find that statutory diversity having become a mandate and hence a non-discriminatory factor during the period of study among the firms has little influence on M&A performance. In another study in Australian context, Ali et al. (2014) find that high boardroom gender diversity contributes to high employee productivity linearly and low age diversity contributes to high ROA in an inverted U-shaped curvilinear fashion for a sample of 288 large organizations listed on Australian Securities Exchange after controlling for firm size, firm age, firm type and industry type.

All in all, the findings from prior work in literature point out that the type of relation between board diversity and firm performance varies both in magnitude and direction depending on the type of diversity, measure of firm performance and most importantly the country of interest under study.

2.4 Problems with Board Diversity Studies

Several studies on board diversity suffer from various limitations. Few of them are as follows:

- *Lack of External Validity:* Though directors of a board are drawn from the general population, their personality traits are not the same as of the general population and as such they are highly non-representative of the general population, causing a lack of external validity (Ferreira, 2014). For instance, women being more risk-averse than men in the general population does not translate to female directors being more risk-averse than their male counterparts (Ferreira, 2014).
- *Limitations of Research Methods:* Several papers from literature use the method of Instrument Variables (IV) or one of its variant like generalized method of moments (GMM), dynamic panel method, two-stage least squares (2SLS) regression, three-stage least squares (3SLS) regression which remain useful as long as the chosen instrument is valid and these methods suffer from limitations because of their inability to test the validity of all the assumptions (Ferreira, 2010). Also, several methods are unable to establish causal relationship among the variables of study.
- *Possibility of Existence of Intermediate Variables:* Several intermediate variables also affect the relation between board diversity and firm performance. For instance, Firm ownership pattern affects board diversity in the form of composition of board and as a result highly concentrated firms like family firms are likely to have low levels of board diversity (Ben-Amar et al., 2013).
- *Limitations of Natural Experiments:* Some researchers use natural experiments such as one pertaining to introduction of Norwegian gender quota to establish causality between board diversity and firm performance, but the lack of randomly chosen control group and endogenous choice of timing are two major problems with these natural experiments (Ferreira, 2010).
- *Choice of the Dependent Variable:* Most of the literature on the study of board diversity takes general measure of firm performance as a dependent variable for studying the impact of diversity among the board of directors. However, not every decision which impacts the performance of a firm is taken by the board of directors. It is imperative to take into account those measures which get directly impacted by decisions taken by the board so as to enhance the validity of the research findings. This could very well be one of the reasons why several studies in the literature report conflicting findings while studying the association of board diversity with firm performance.

3 Data, Variables and Methodology

3.1 Sample Selection

The sample selection begins with the firms comprising CNX 500, Indian capital market's broad-based benchmark representing about 96% of free float market capitalization of the stocks listed on National Stock Exchange (NSE)[2]. The board-level diversity data has been arrnaged from NSE Infobase on Indian Boards and other firm level data has been obtained from Prowess which is maintained by Center for Monitoring Indian Economy (CMIE). Prowess in Indian context is analogous to Compustat in the US context. Firms belonging to the banking and financial sector, identified with National Industrial Classification (NIC) code 64, have been removed from the sample owing to their different set of regulations and capital structure requirements in line with prior work in literature (Jaiswall & Banerjee, 2012). Firms with incomplete data on diversity variables have been excluded. This left us finally with a sample of 219 firms for analysis.

3.2 Variables

We capture both demographic as well as statutory diversity variables. Demographic diversity of board members has been captured through attributes like gender, age, nationality, educational qualification and tenure with the firm. Statutory diversity has been captured based on the independence status of the board members as reported by each firm in line with Clause 49 definition. Both demographic and statutory diversity attributes are our primary independent variables. We do not pool the various diversity scores to create a single diversity index unlike several other research studies (Ararat, Aksu, & Tansel Cetin, 2015) as it has the potential to mask the actual association of each diversity attribute. We use three diversity measures viz. Blau Index (Ararat et al., 2015; Blau, 1977; Campbell & Mínguez-Vera, 2008), Shannon Index (Campbell & Mínguez-Vera, 2008; Shannon, 1948) and Coefficient of Variation for defining our attributes. Each of these is described below briefly:

a) Blau Index for an attribute is given by the following expression:

$$Blau\ Index = 1 - \sum_{i=1}^{k} P_i^2$$

[2] http://www.nseindia.com/products/content/equities/indices/cnx_500.htm

where P_i is the proportion of board members in category *i* and *k* is the number of categories within the given attribute. While the minimum value of Blau Index is zero when all the members are present in only one category, its maximum value for an attribute depends not only on the proportion of members within those categories, but also on the number of categories within that attribute. For an attribute with *k* categories, the maximum value of Blau Index is $\frac{k-1}{k}$ and is achieved when members are present in all categories in equal proportion. Therefore, Blau Index values for each attribute have been normalized or standardized by dividing them with $\frac{k-1}{k}$.

b) Shannon Index for an attribute is given by the following expression:

$$Shannon\ Index = -\sum_{i=1}^{k} P_i \ln P_i$$

where P_i and *k* have same meaning as in Blau Index expression. Again, the minimum value of Shannon Index is 0 corresponding to complete homogeneity i.e. presence of all members in one and only one category and its maximum value for an attribute depends on the number of categories within that attribute as well as on the proportion of members within those categories. For an attribute with *k* categories, the maximum value of Shannon Index that can be achieved is *ln(k)*. Therefore, Shannon Index values for each attribute in the sample have been normalized or standardized by dividing them by *ln(k)*.

c) Coefficient of variation for an attribute is given by the following expression:

$$Coefficient\ of\ Variation = \frac{Standard\ Deviation\ (\sigma)}{Mean\ (\mu)}$$

For categorical variables like gender, educational qualification, nationality and board independence, both Blau and Shannon Indices have been used. However, because of unsuitability of Blau and Shannon indices for continuous variables in line with prior work in literature, coefficient of variation has been used as it gives the most direct and scale-invariant diversity measure (Tsui, Egan, & Xin, 1995).

We control for all major variables such as board size, firm size, firm age and leverage as has been done by similar studies in the literature. We take three measures of general firm performance - Return on Assets (ROA), Return on Equity (ROE) and Tobin's Q - have been taken as dependent variables one by one. Table 1 details the definitions of the various variables used in the study.

VARIABLE	DEFINITION
% Promoter Concentration	Cumulative shareholding of all promoters expressed in percentage
% Institutional Shareholding	Cumulative shareholding of all non-promoter institutions expressed in percentage
Board Size	Total number of directors on the board at the end of financial year
Firm Size	Natural logarithm of total assets
Firm Age	Number of years starting from firm's incorporation year till Mar 31, 2014
Leverage	Total Assets / Net Worth
Gender Diversity	Measured separately using both Blau and Shannon indices with two categories viz. male and female directors on board
International Diversity	Measured separately using both Blau and Shannon indices with two categories viz. Indian and non-Indian directors on board
Educational Diversity	Measured separately using both Blau and Shannon indices with five categories viz. schooling, under graduation, graduation, post-graduation and doctorate for directors
Statutory Diversity	Measured separately using both Blau and Shannon indices with two categories viz. independent and non-independent for directors
Age Diversity	Measured using coefficient of variation of age (with age being the number of years starting from the date of birth till Mar 31, 2014)
Tenure Diversity	Measured using coefficient of variation of tenure (with tenure being the number of years starting from the appointment date to Mar 31, 2014)
Tobin's Q	(Total Assets + Market Capitalization – Net Worth) / Total Assets
Return on Assets(ROA)	Profit After Tax / Average Total Assets
Return on Equity (ROE)	Profit After Tax / Average Net Worth

Table 1: *Variable Definitions*

While the definitions of ROA and ROE we have used are quite standard, we have defined Tobin's Q as given in prior work in literature (Dargenidou, Jaafar, & McLeay, 2014).

3.3 Model

We propose the following OLS regression model for studying the association of board diversity on firm performance for a cross-sectional sample:

$$
\begin{aligned}
Firm\ Performance_i &= \beta_0 + \beta_1\ Promoter\ Concentration_i + \beta_2\ Institutional\ Shareholding_i \\
&+ \beta_3\ Board\ Size_i + \beta_4\ Firm\ Size_i + \beta_5\ Leverage_i + \beta_6\ Gender\ Diversity_i \\
&+ \beta_7\ International\ Diversity_i + \beta_8\ Educational\ Diversity_i + \beta_9\ Statutory\ Diversity_i \\
&+ \beta_{10}\ Age\ Diversity_i + \beta_{11}\ Tenure\ Diversity_i + \varepsilon_i
\end{aligned}
$$

We also tried taking the family firm dummy instead of promoter concentration and institutional shareholding in another model defined as follows:

$$Firm\ Performance_i = \beta_0 + \beta_1\ Family\ Firm\ Dummy_i + \beta_2\, Board\ Size_i + \beta_3\, Firm\ Size_i + \beta_4\, Leverage_i + \beta_5\, Gender\ Diversity_i + \beta_6\, International\ Diversity_i + \beta_7\, Educational\ Diversity_i + \beta_8\, Statutory\ Diversity_i + \beta_9\, Age\ Diversity_i + \beta_{10}\, Tenure\ Diversity_i + \varepsilon_i$$

We define a firm in two ways in line with prior work in literature. Firstly, we classify a firm with cumulative promoter shareholding of not less than 51% as a family firm and a non-family firm otherwise (Saravanan, 2009). In another classification, we define a firm with at least two directors with same surname as a family firm and a non-family firm otherwise (Arosa, Iturralde, & Maseda, 2010; Jaiswall & Banerjee, 2012; Rutherford, Kuratko, & Holt, 2008).

4 Empirical Results

4.1 Descriptive Statistics

Descriptive Statistics (Comparison of Family & Non-family Firms)

	Family Firms					Non-family Firms				
	N	Minimum	Maximum	Mean	Std. Deviation	N	Minimum	Maximum	Mean	Std. Deviation
% Promoter Concentration	140	51.00%	90.00%	66.1624%	8.89681%	79	0.00%	50.75%	38.2930%	10.77308%
% Institutional Shareholding	140	.86%	40.10%	17.2029%	8.95850%	79	.21%	55.07%	28.9756%	14.63597%
Board Size	140	3	19	8.99	2.893	79	5	16	9.46	2.526
Firm Size	140	7.6368	14.6792	10.604525	1.3478657	79	8.0500	15.1177	10.888101	1.4496114
Firm Age	140	7	143	34.12	23.150	79	7	117	47.47	27.233
Leverage	140	1.0291	108.0574	3.072672	9.0064585	79	1.1538	96.3038	3.778995	10.7112316
Gender Blau Diversity	140	0.0000	.8889	.209293	.2614770	79	0.0000	.6914	.211792	.2343721
International Blau Diversity	140	0.0000	1.0000	.228935	.3510723	79	0.0000	.9256	.174163	.2718458
Educational Blau Diversity	140	0.0000	.9028	.576266	.1919915	79	0.0000	.9028	.576699	.1779994
Statutory Blau Diversity	140	.5556	1.0000	.950271	.0811999	79	.4898	1.0000	.930416	.1073623
Gender Shannon Diversity	140	0.0000	.9183	.250981	.3019715	79	0.0000	.7642	.261829	.2799606
International Shannon Diversity	140	0.0000	1.0000	.250159	.3714213	79	0.0000	.9457	.203522	.3068771
Educational Shannon Diversity	140	0.0000	.8445	.468799	.1673046	79	0.0000	.8262	.463989	.1580756
Statutory Shannon Diversity	140	.6500	1.0000	.962899	.0620780	79	.5917	1.0000	.947520	.0833694
Age COV Diversity	140	.0632	.2708	.162264	.0534302	79	.0600	.3701	.156825	.0482823
Tenure COV Diversity	140	.0820	2.1408	.677257	.2698837	79	.0509	1.2469	.700100	.2340082
ROA = PAT as a % of Average Total Assets	140	-23.9%	36.6%	7.672%	8.8282%	79	-11.8%	116.2%	7.858%	14.8869%
ROE = PAT as a % of Average Net Worth	140	-178.8%	130.0%	13.529%	24.2274%	79	-170.2%	234.0%	10.071%	38.6586%
Tobin's Q	140	.5989	16.9630	2.544637	2.6721152	79	.5018	8.2476	1.905861	1.4928613
Valid N (listwise)	140					79				

Table 2: *Descriptive Statistics*

In the total sample of 219 firms, 140 are family firms based on if the cumulative promoter shareholding of not less than 51% and 79 non-family firms otherwise. From the descriptive statistics shown in Table 2, it follows that the average promoter shareholding is about 66% in family-firms and about 38% in non-family firms. The t-test for equality of means (not tabulated) shows that only promoter concentration (%), institutional shareholding (%) and firm age are significantly different between family and non-family firms. Rest all the variables are non-significant in the sample. Defining a family firm in a different way may yield very different results for the same sample of firms.

Another way of defining family firms based on the presence of at least two directors with the same surname on the board throws very different results (not tabulated). We get 122 family firms and 97 non-family firms in our total sample using this definition. Notably, family firms have significantly higher gender, educational, statutory and age diversity. The t-test for equality of means (not tabulated) shows that in addition to board size, family firms differ from non-family firms for all kinds of chosen diversity types except tenure diversity. Family

firms have significantly higher gender, education, statutory and age diversities than non-family firms in the sample. Only international diversity is higher in non-family firms. However, we do not find significant difference in any of the measures of firm performance between family and non-family firms.

4.2 Correlation Matrix (Blau Indices)

Correlations (Blau)

		% Promoter Concentration	% Institutional Shareholding	Board Size	Firm Size	Firm Age	Leverage	Gender Blau Diversity	International Blau Diversity	Educational Blau Diversity	Statutory Blau Diversity	Age COV Diversity	Tenure COV Diversity	ROA = PAT as a % of Average Total Assets	ROE = PAT as a % of Average Net Worth	Tobin's Q
% Promoter Concentration	Pearson Correlation	1														
	Sig. (2-tailed)															
	N	219														
% Institutional Shareholding	Pearson Correlation	-.591**	1													
	Sig. (2-tailed)	.000														
	N	219	219													
Board Size	Pearson Correlation	-.104	.209**	1												
	Sig. (2-tailed)	.123	.002													
	N	219	219	219												
Firm Size	Pearson Correlation	-.119	.391**	.451**	1											
	Sig. (2-tailed)	.079	.000	.000												
	N	219	219	219	219											
Firm Age	Pearson Correlation	-.243**	.233**	.167*	.176**	1										
	Sig. (2-tailed)	.000	.001	.013	.009											
	N	219	219	219	219	219										
Leverage	Pearson Correlation	-.022	-.046	.096	.079	.014	1									
	Sig. (2-tailed)	.745	.501	.157	.242	.839										
	N	219	219	219	219	219	219									
Gender Blau Diversity	Pearson Correlation	-.004	.072	.116	.009	-.034	.038	1								
	Sig. (2-tailed)	.949	.290	.087	.889	.617	.581									
	N	219	219	219	219	219	219	219								
International Blau Diversity	Pearson Correlation	.012	.171*	.106	-.019	.003	-.051	.202**	1							
	Sig. (2-tailed)	.861	.011	.117	.775	.963	.454	.003								
	N	219	219	219	219	219	219	219	219							
Educational Blau Diversity	Pearson Correlation	.020	-.023	.034	.152*	-.037	.026	.010	.015	1						
	Sig. (2-tailed)	.764	.739	.619	.025	.585	.698	.879	.821							
	N	219	219	219	219	219	219	219	219	219						
Statutory Blau Diversity	Pearson Correlation	.058	-.062	.204**	-.034	-.021	.044	.039	-.056	-.060	1					
	Sig. (2-tailed)	.397	.364	.002	.618	.760	.516	.562	.406	.380						
	N	219	219	219	219	219	219	219	219	219	219					
Age COV Diversity	Pearson Correlation	.015	-.155*	-.006	-.161*	-.124	.027	.051	-.038	.064	.222**	1				
	Sig. (2-tailed)	.820	.021	.931	.017	.067	.693	.451	.578	.348	.001					
	N	219	219	219	219	219	219	219	219	219	219	219				
Tenure COV Diversity	Pearson Correlation	-.115	.180**	.227**	.173*	.285**	-.001	.119	.350**	.015	-.028	-.008	1			
	Sig. (2-tailed)	.089	.008	.001	.010	.000	.983	.078	.000	.821	.684	.909				
	N	219	219	219	219	219	219	219	219	219	219	219	219			
ROA = PAT as a % of Average Total Assets	Pearson Correlation	-.034	.176**	-.007	-.160*	-.094	-.175**	.036	.132	-.104	-.138*	-.055	.013	1		
	Sig. (2-tailed)	.613	.009	.920	.018	.167	.010	.598	.050	.125	.042	.415	.850			
	N	219	219	219	219	219	219	219	219	219	219	219	219	219		
ROE = PAT as a % of Average Net Worth	Pearson Correlation	.014	.135*	-.035	-.142*	-.078	-.636**	-.020	.081	-.055	-.122	-.064	-.003	.802**	1	
	Sig. (2-tailed)	.835	.046	.606	.036	.253	.000	.771	.234	.421	.071	.349	.968	.000		
	N	219	219	219	219	219	219	219	219	219	219	219	219	219	219	
Tobin's Q	Pearson Correlation	.100	.089	-.028	-.250**	-.056	-.078	-.040	.261**	-.108	.086	-.094	-.099	.379**	.316**	1
	Sig. (2-tailed)	.141	.190	.678	.000	.410	.253	.555	.000	.110	.207	.167	.143	.000	.000	
	N	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3: *Correlation Matrix (Blau Indices)*

4.3 Correlation Matrix (Shannon Indices)

Correlations (Shannon)

		% Promoter Concentration	% Institutional Shareholding	Board Size	Firm Size	Firm Age	Leverage	Gender Shannon Diversity	International Shannon Diversity	Educational Shannon Diversity	Statutory Shannon Diversity	Age COV Diversity	Tenure COV Diversity	ROA = PAT as a % of Average Total Assets	ROE = PAT as a % of Average Net Worth	Tobin's Q
% Promoter Concentration	Pearson Correlation	1														
	Sig. (2-tailed)															
	N	219														
% Institutional Shareholding	Pearson Correlation	-.591**	1													
	Sig. (2-tailed)	.000														
	N	219	219													
Board Size	Pearson Correlation	-.104	.209**	1												
	Sig. (2-tailed)	.123	.002													
	N	219	219	219												
Firm Size	Pearson Correlation	-.119	.391**	.451**	1											
	Sig. (2-tailed)	.079	.000	.000												
	N	219	219	219	219											
Firm Age	Pearson Correlation	-.243**	.233**	.167*	.176**	1										
	Sig. (2-tailed)	.000	.001	.013	.009											
	N	219	219	219	219	219										
Leverage	Pearson Correlation	-.022	-.046	.096	.079	.014	1									
	Sig. (2-tailed)	.745	.501	.157	.242	.839										
	N	219	219	219	219	219	219									
Gender Shannon Diversity	Pearson Correlation	-.019	.087	.145*	.030	-.016	.034	1								
	Sig. (2-tailed)	.782	.199	.031	.664	.816	.620									
	N	219	219	219	219	219	219	219								
International Shannon Diversity	Pearson Correlation	-.006	.189**	.117	-.010	.013	-.041	.216**	1							
	Sig. (2-tailed)	.929	.005	.083	.885	.843	.550	.001								
	N	219	219	219	219	219	219	219	219							
Educational Shannon Diversity	Pearson Correlation	.031	-.023	.074	.151*	-.029	.025	.016	.048	1						
	Sig. (2-tailed)	.646	.732	.275	.025	.675	.716	.811	.476							
	N	219	219	219	219	219	219	219	219	219						
Statutory Shannon Diversity	Pearson Correlation	.056	-.059	.202**	-.035	-.019	.044	.051	-.049	-.061	1					
	Sig. (2-tailed)	.407	.383	.003	.603	.779	.518	.455	.469	.371						
	N	219	219	219	219	219	219	219	219	219	219					
Age COV Diversity	Pearson Correlation	.015	-.155*	-.006	-.161*	-.124	.027	.040	-.041	.054	.219**	1				
	Sig. (2-tailed)	.820	.021	.931	.017	.067	.693	.561	.543	.423	.001					
	N	219	219	219	219	219	219	219	219	219	219	219				
Tenure COV Diversity	Pearson Correlation	-.115	.180**	.227**	.173*	.285**	-.001	.135*	.345**	.011	-.026	-.008	1			
	Sig. (2-tailed)	.089	.008	.001	.010	.000	.983	.046	.000	.869	.700	.909				
	N	219	219	219	219	219	219	219	219	219	219	219	219			
ROA = PAT as a % of Average Total Assets	Pearson Correlation	-.034	.176**	-.007	-.160*	-.094	-.175**	.035	.121	-.078	-.136*	-.055	.013	1		
	Sig. (2-tailed)	.613	.009	.920	.018	.167	.010	.608	.074	.251	.044	.415	.850			
	N	219	219	219	219	219	219	219	219	219	219	219	219	219		
ROE = PAT as a % of Average Net Worth	Pearson Correlation	.014	.135*	-.035	-.142*	-.078	-.636**	-.019	.068	-.036	-.121	-.064	-.003	.802**	1	
	Sig. (2-tailed)	.835	.046	.606	.036	.253	.000	.778	.318	.595	.074	.349	.968	.000		
	N	219	219	219	219	219	219	219	219	219	219	219	219	219	219	
Tobin's Q	Pearson Correlation	.100	.089	-.028	-.250**	-.056	-.078	-.046	.258**	-.071	.085	-.094	-.099	.379**	.316**	1
	Sig. (2-tailed)	.141	.190	.678	.000	.410	.253	.501	.000	.299	.209	.167	.143	.000	.000	
	N	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4: *Correlation Matrix (Shannon Indices)*

Both correlation matrices (one using Blau Index and other Shannon Index for categorical diversity measures) are mostly similar except for some significant correlations highlighted in orange. The underlying implication of both the matrices is the significant positive association between ROA and Statutory Diversity on one hand and negative association between Tobin's Q and International Diversity on the other hand (highlighted in green).

4.4 Regression Results

Using two measures of firm performance - ROA and Tobin's Q and two measures of diversity – Blau Index and Shannon Index for categorical diversity attributes, we have four possible models as given in Table 5.

	Dependent Variables for Various Models			
	Model 1	***Model 2***	***Model 3***	***Model 4***
Independent Variables	**ROA**	**Tobin's Q**	**ROA**	**Tobin's Q**
(Constant)	41.671***	4.594**	46.845***	3.764**
	(10.54)	(2.05)	(12.42)	(2.42)
% Promoter Concentration	0.085	0.033***	0.087	0.034***
	(0.06)	(0.01)	(0.06)	(0.01)
% Institutional Shareholding	0.306***	0.061***	0.311***	0.061***
	(0.08)	(0.02)	(0.08)	(0.02)
Board Size	0.552*	0.082	0.567*	0.085
	(0.31)	(0.06)	(0.31)	(0.06)
Firm Size	-2.514***	-0.617***	-2.584***	-0.628***
	(0.66)	(0.13)	(0.66)	(0.13)
Firm Age	-0.054*	0.000	-0.054*	0.000
	(0.03)	(0.01)	(0.03)	(0.01)
Leverage	-0.156**	-0.005	-0.157**	-0.006
	(0.08)	(0.01)	(0.08)	(0.01)
Gender Blau Diversity	0.007	-0.936		
	(2.96)	(0.58)		
International Blau Diversity	1.229	1.902***		
	(2.5)	(0.49)		
Educational Blau Diversity	-4.008	-0.500		
	(3.95)	(0.77)		
Statutory Blau Diversity	-19.14**	2.467		
	(8.36)	(1.63)		
Gender Shannon Diversity			0.083	-0.854
			(2.55)	(0.5)
International Shannon Diversity			0.737	1.745***
			(2.33)	(0.45)
Educational Shannon Diversity			-3.147	-0.253
			(4.52)	(0.88)
Statutory Shannon Diversity			-24.719**	3.171
			(10.86)	(2.11)
Age COV Diversity	-5.423	-4.907	-6.110	-5.006
	(14.8)	(2.88)	(14.8)	(2.88)
Tenure COV Diversity	0.291	-1.541**	0.463	-1.495**
	(3.2)	(0.62)	(3.2)	(0.62)
Observations	219	219	219	219
R-square	0.17	0.26	0.17	0.25

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: *Regression Results*

Model 1 makes use of Blau Indices for categorical diversity attributes as some of the independent variables and ROA as a dependent variable. From the results, it follows that Model 1 is significant and after controlling for board size, firm size, firm age and leverage, Blau Index for statutory diversity is negatively associated with ROA at 5% level of significance. Looking at the prior work in literature suggests that this relation is not a new finding and over-monitoring in already well-governed firms may harm performance (Adams & Ferreira, 2009). There is no significant association of any other form of diversity with ROA. Also, it does not depend on promoter concentration.

Model 2 makes use of Blau Indices for categorical diversity attributes as some of the independent variables and Tobin's Q as a dependent variable. From the results, it follows that Model 2 is significant and after controlling for board size, firm size, firm age and leverage, Blau Index for international diversity is positively associated with Tobin's Q at both 1% and 5% levels of significance. Tenure diversity as defined by coefficient of variation is negatively associated with Tobin's Q. There is no significant association with any other forms of diversity. Also, Tobin's Q depends on promoter concentration as well as institutional shareholding. This could mean that firms with more international directors are rewarded more by investors than firms with less international diversity. Also, those firms where directors have repeat appointments increasing their tenure with the firms are valued less favourably by their investors.

Models 3 and 4 are essentially similar to Models 1 and 2 respectively, but with Blau Indices replaced with Shannon Indices for categorical forms of diversity. The results of Models 3 and 4, as such, remain broadly the same as those of Models 1 and 2 respectively.

On replacing promoter concentration and institutional shareholding with family firm dummy in all the four models (results not tabulated) to check if the results change depending on the firm type, we are unable to establish it with our chosen definition of the family firm.

5 Conclusions & Discussion

5.1 Results & Conclusions

- Tobin's Q is positively associated with by international diversity at 99% level and negatively by tenure diversity at 95% level. This could mean that firms with more international directors are rewarded more by investors than firms with less international diversity. Also, those firms where directors are reappointed again and again resulting in increase of their tenure with the firms are valued less by their investors.
- ROA is negatively associated with statutory diversity 95% level. Looking at the prior work in literature suggests that this relation is not a new finding and over-monitoring in already well-governed firms may harm performance (Adams & Ferreira, 2009).
- In our sample, we do not find family firms and non-family firms different in diversity and performance measures when classifying firms with not less than 51% promoter shareholding as family firms. On defining family firms in another way as firms with at least two directors with same surname on the board, we find significant difference in gender, international, educational, statutory and age diversity levels, but not in any of the measures of firm performance. Irrespective of the definition used, we do not find significant difference in the association of board diversity on firm performance contingent upon the firm type (i.e. whether a firm is family firm or not). These results, of course, hold for our chosen definitions of a family firm out of several definitions used in the prior work in literature.
- We find the similar results with Blau and Shannon indices broadly with all other things remaining constant.

5.2 Scope for Future Research

Future work can cover the following aspects:

- *Taking Specific Firm Performance Contingent upon Board Actions as the Dependent Variable:* Not every decision which impacts the performance of a firm is taken by the board of directors. It is imperative to take into account those performance measures which get directly impacted by decisions taken by the board so as to enhance the validity of the research findings. This could very well be one of the reasons why

several studies in the literature report conflicting findings when studying the impact of board diversity on firm performance. Future research could examine the impact of board diversity by taking specific firm performance contingent largely upon the actions of the board and subsequently examine the effect various kinds of diversities have on it.

- *Exploring Beyond Linear Relations:* Some of the independent variables might have non-linear relations with the dependent variable(s) and as such it becomes important to check if the non-linear relations between the variables of interest exist.
- *Deploying Strong Research Methods and Robustness Checks:* Instead of just a cross-sectional sample, use of panel data to check the relationships among the variables of interest will further validate the findings. Additionally, use of robust econometric techniques to overcome problems of endogeneity and to clearly establish causality among the variables of interest could also be addressed in the future research.

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