Corporate Governance Mechanism, Dividend policy, and Firm Efficiency

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Abstract

This study aims to investigate the impact of the corporate governance system on dividend policy and firm efficiency while combining the Principal component analysis and Panel regression models. We employed the first method principal component analysis to estimate the governance indices for the Karachi stock exchange (KSE). The second one incorporates investigating the association between governance indices and dividend policy. In addition, Cost efficiency is estimated through data envelopment analysis and Ordinary least square employed to estimate investment efficiency. Furthermore, hierarchical regression model estimates the interaction effect of investment efficiency between corporate governance indices and dividend policy. Applying these methods for sample incorporated in 2012-19 for Pakistani listed firms in KSE. We find that the Board diversity index of corporate governance is significantly associated with dividend policy. Moreover, firms involved in high investment efficiency are moderating the relationship of the diversity index with dividend policy.

Keywords- Corporate governance index, Investment efficiency, Principal component analysis, Dividend policy, panel regression models, Hierarchical regression

Introduction

Agency theory assumes that business managers utilize firms' resources and work for their interests instead of maximizing shareholders' wealth (Jensen and Meckling, 1976). Hence misallocation of investments reduces shareholders' dividends. Dividend policy is determined by agency cost due to conflict of interest between shareholders and management (Jensen, 1986). In this situation, management may not be able to choose a dividend policy that maximizes shareholders' wealth rather than maximizing their benefits (Jiraporn et al., 2012). Freidman (1962) postulate that main objective of business to work for the interest of shareholder and accordance their wishes. Hence managers have moral obligations to maximize shareholders' wealth. Freeman (1984) argues that a firm's responsibility is to operate in the interest of all stakeholders

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e.g. consumers, employees, and the general public. Hence a common consumer is a stakeholder for a firm that demands the products and services at affordable prices. In the earlier literature, a huge gap is found in addressing consumers while considering shareholders' wealth maximization. A common consumer is also a stakeholder of the organization. Hicks (1935) stated that business managers enjoy a 'Quiet life' in which they relax their efforts to minimize cost. They set higher prices to achieve profit targets that result in cost inefficiency of firms. Reduction in cost efficiency tends to create a loss of consumer surplus and social welfare performance of the organization. A common consumer bears loss due to higher prices in the form of a quiet life. Over-pricing reduces the purchasing ability that creates a loss of consumer surplus. (Ikeda et al., 2018).

Coleman (1979) explained that prices have a significant contribution to wealth maximization. The system of wealth maximization cannot address the right prices. Fama and Jensen (1983) postulate good corporate governance promotes higher dividend payments (wealth maximization). Agency theory argued that reducing agency problems leads to an increase in cost efficiency which ultimately enhances the financial performance of the firm. Better performance means an increase in shareholder wealth by their dividends payment that is the ultimate goal of corporate governance (Shlefier & Visheny, 1997). Veljanovski (1981) claims that cost efficiency is more desirable for wealth maximization. Wealth maximization must be gained through efficient use of the firm's resources at which common consumers are willing to pay. However, wealth maximization (Coleman, 1979) is being less fortunate the final consumers. Wealth maximization fails to consider the preferences of final consumers. The ethical responsibility of the firms is to maximize the wealth in a way that does not affect prices (cost efficiency). Therefore, the corporate sector must enhance shareholders' wealth by considering cost-efficiency.

Developing countries like Pakistan are facing weak law enforcement and high political corruption (Javed & Iqbal, 2008) lack of transparent decisions making a strong political connection in the corporate sector, and dominance of family-owned business (Muttakin et al., 2014). Agency problems in developing countries like Pakistan are termed principal-principal conflicts (F. Yousuf et al., 2018; Lau, 2009). In Pakistan mostly business is based on family control in which decisions made are not in favor of shareholders (Li & Qian, 2013). The security and exchange commission of Pakistan has scaled down the dividend distribution period from fifteen working days to three working days. The amendment is made to reduce the difficulties in the determination of rightfully entitled shareholders and investors and documentation requirements in the case of the international investor. According to the amendment in dividend distribution regulations (2017) of companies, the dividend must be paid within three working days from the date of approval by the general meeting of firms 'shareholders in the case of final dividend and board in case of interim dividend (Haque, 2021).

Commodity prices of food and non-food items are inflated very sharply in Pakistan (M.N. Sarwar et al., 2020). Due to higher movements in prices, the purchasing power of the common consumer in Pakistan reduces (Gasaymeh, 2019). Hence, higher prices are indicating *Quite a Life* and loss of social welfare performance or consumer surplus through cost inefficiency. Therefore, mostly profits in the corporate sector of Pakistan are Quiet life confirming the argument given by Hicks (1935). Hence the research question of this study can be described as follows: How to evaluate corporate governance indices' effect on dividend policy and cost-efficiency. So we incorporate governance indices to address both dividend policy (shareholders' wealth) and cost efficiency (consumer prices). To the best of our knowledge, the first contribution of the study is the construction of corporate governance indices through principal component analysis. Secondly,

these indices are being investigated with dividend policy and cost-efficiency. Thirdly we explored the interaction effect of firms getting efficient investment on dividend policy.

Quality of corporate governance is investigated through the structure of supervision and control in terms of board characteristics, board diversity ownership structure, and audit quality. Thus the introduction of all corporate governance variables optimizes the explanatory power of the model. The inclusion of all corporate governance variables can create statistical problems due to existing interrelations and complimentary relationships between corporate governance mechanisms (Florackis 2005; Lasfer 2006). Moreover, the inclusion of too many variables can over-specified the model that ultimately influences reliability and validity. Hence the conclusion of the results is created limitations. To overcome all these problems based on prior literature we required corporate governance variables based on similar characteristics. In the earlier literature governance index was employed by the overall dimensions of the board. However, this study constructed three indices based on board characteristics (duality, executive and non-executive directors and total board members), board quality (audit committee members, audit committee independence, audit committee meetings, and board meetings), and board diversity (Gender diversity, educational diversity, ethnic diversity, and caste diversity). Grove et al. (2011) argue that corporate governance variables can impact significantly at the individual level but have a marginal impact if we take a combined set of variables. Gao (2015) employed a corporate governance index by considering many dimensions of the corporate board to investigate the influence of the overall corporate governance system on non-performing loans. To investigate the purpose of this research the first step required the construction of indices based on the similar characteristics of corporate governance variables. The constructed indices are based on the method of principal component analysis. Previous studies (Amman et al., 2012; Veorauskaite and Adams 2013) mostly constructed index through principal component analysis. In the next step panel regression model was employed to estimate results. To confirm our model at the empirical level we employed the sample of 77 listed firms in the Karachi stock exchange in Pakistan, based on the periods of 2012-19. In the next section, we explain theory and hypotheses development. The third section illustrates the data sample, variables and methodology employed. Results and findings are presented in the fourth section. The last section incorporates discussions and conclusions.

Literature Review and Hypotheses Construction

Corporate governance is a complete system that not only built the relationship between Managers, investors, and shareholders but also provides resources for long-term business. In addition to it provides a structure for the achievement of business objectives and goals by examining the performance. Regulatory bodies can assess the complete corporate governance structure and compare them with the respective corporate sector through governance scores. In the previous studies, corporate governance indices are employed in the context of developed countries. Our study tries to incorporate new insights in the context of developing countries specifically Pakistan. Previous studies in this regard are followed e.g. (Aggarwal et al., 2010; Arora and Sharma, 2016; Brown and Caylor, 2006; Iqbal et al., 2019; Liu et al., 2018)

 Corporate Governance and Dividend policy

The moral obligation of the corporate business is to maximize shareholders' wealth (Freidmen, 1962). But Jensen and Meckling (1976) argue that due to agency conflicts managers misappropriate the firms' resources for their interest rather than paying dividends to shareholders. La Porta, et al. (2000) argue that strong governance in the corporate sector promotes higher

dividends payouts due to pressure of minority shareholders. Thus it reduces the agency cost of free cash flows (Atanassov and Mandell, 2018; Francis et al., 2011). Cash dividend payout is strongly associated with corporate governance (Benavides, et al. 2016; Kilincarslan & Ozdemir, 2018). Good governance motivates the investor to reinvest their dividends for higher returns (Benavides et al., 2016; Widyasti et al., 2020). Firms with a weak governance structure may hold cash for perquisite consumption and invest at the expense of shareholders (Tang, 2020). But managers in strong governance have less probability to misuse the shareholders' investment and are more likely to pay out dividends (Jiraporn et al., 2011; Kim et al., 2020). Index of board structure and audit committee is strongly associated with propensity to pay dividends (Pahi and Yadav, 2019). The ownership index of the sharia compliance firms is strongly associated with higher dividends payouts (N. Imamah et al., 2019). Shamsabadi et al. (2020) found a strong relationship between governance index and dividend reinvestment plan. Reinvestment of dividends by the investor is enhanced by quality governance. Good governance enhances the supply of dividends reinvestment plans and a variety of clientele demands on dividends payouts (Ngo et al., 2020). A data triangulation approach found a positive association between governance and propensity to pay dividends (Baker et al., 2020). Board accountability and audit committee indices are significantly associated with the financial performance of Indian listed firms. But transparency index was not found to be significant with payouts. Furthermore, the governance index of Dubai-listed firms is positively associated with accounting performance but negatively associated with economic performance (W.M. Al-ahdal et al., 2020). Hence we hypothesize that

H1: corporate governance index has a significant impact on dividend payout.

Corporate Governance and Cost efficiency

Along with maximizing shareholders' wealth, it is the ethical responsibility of the corporate sector to minimize consumer losses and maximize social welfare (Coleman 1967). In shareholders' wealth maximization a business is unable to maximize social welfare. Consumer prices are mostly ignored in wealth maximization that creates a loss of social welfare (Jhones and Felps 2013). A quiet life hypothesis suggests that consumer bears high prices due to inefficient costing of managers. Cost inefficiency creates high prices hence loss of consumers' surplus that forces them to pay more than aggregate willingness (Hicks 1935). Ethical responsibility of corporate business to maximize shareholders' wealth in away consumer prices not affected.

Efficient allocation of resources and funds is the responsibility of corporate governance. Quality governance allocates resources at the efficient capital structure with a minimum cost of capital with the highest firm value. Corporate board composition is significantly associated with cost efficiency (Lee et al., 2019). Quality in corporate governance is found to enhance the efficiency positively and significantly in the domestic owned firms (Vitaliy Zheka, 2005). Cost and technical efficiencies in the banking industry of central and eastern Europe increased by the implementation of a rigorous corporate governance structure (Andries et al., 2018). Safiullah and Shamsuddin (2019) found profit efficiency enhanced by the corporate board in the Islamic banks because of the shariah supervisory board. He et al., (2020) found a significant association between corporate governance characteristics and cost efficiency in the Chinese steel industry. Board size, institutional ownership, equity incentives, and directors' compensation are strongly associated with cost-efficiency. In the line with agency theory, Shabir et al. (2020) found board size is significantly but negatively associated with cost-efficiency. A larger size in the board attenuates monitoring and controlling functions. Decisions made in the larger board are less efficient because

of coordination issues (Jensen 1993). Corporate boards with gender diversity improve the cost efficiency of the banking industry but independent directors are negatively related to cost efficiency (Adeabh et al., 2019).

H2: corporate governance index has a significant impact on cost efficiency.

Interaction effect of investment efficiency

A fundamental question in corporate finance is an optimal investment for a particular business. In a frictionless market maximum investment is based on the investment opportunities (Modigillani & Miller, 1958). Shareholders are very careful about their dividends due to agency conflicts between managers and outside investors. The self-interest behavior of the managers creates inefficiency in the optimal investment (Devis, 1995). Agency problem in the corporate sector creates inefficient investment due to the own interest of the management (Chen et al., 2017). Investment inefficiency in the Chinese market is caused by agency conflicts between managers and common shareholders (Guariglia & Yang, 2016). Gan (2019) argued that over and under investment decisions of management generates agency conflicts. In over investment managers prefer to spend more on the projects with negative net present value rather than paying dividends. A higher level of managerial ability in the board of directors promotes efficient investment decisions making. Efficient investment reduces agency conflicts in the corporate governance which made confidence to shareholders' in their investment or dividends (Agyei-Mensah, 2021). In earlier literature, it has been documented that agency conflicts and information asymmetry between managers and investors impact investment decisions. (Tan et al., 2020) argue that director's education promotes information asymmetry that has a significant effect on the efficiency in the investment of corporate sectors. Foreign directors in the corporate board are significantly and positively associated with investment efficiency that implies lowering in agency conflicts hence ultimately dividends payments are increased (Cheng et al., 2017). Female directors on the board lower agency conflicts hence optimal and efficient investments are obtained in the corporates. Returns on this investment build the confidence level of investors (Gao et al., 2017). Ullah et al., (2020) explained diversity in the board of directors contains a various set of skills, knowledge, and problem-solving proficiency that reduces the conflicts of interests and enhance information asymmetry that increases shareholders' interest.

A conflict between firms' management and the outsider's shareholder is also created due to the agency problems alleviated by the institutional ownership. Intuitions in the market have a great influence on the board decisions that impact the managers' decisions, self-interest, and the window dressing that forces them to work for the performance of the organization (Eaton et al., 2014; Aggarwal et al., 2011). Institutions having large ownership improve the ability of corporates to direct efficiently and emphasize the long-term performance of the organizations (Admati & Pfleiderer, 2009). A study found a positive impact of institutional ownership on the efficiency of investment that suggests a larger institutional investor effect on the corporate governance and pronounced as their wealth maximization.

The corporate sector with an efficient investment believes in the reduction of agency conflicts and wealth maximization of shareholders' wealth (Majeed et al., 2018). Optimal and efficient investments enhance the profitability of the corporate sector and then distribute it to their shareholders in terms of dividends. From the above discussion, it is concluded that the firm with
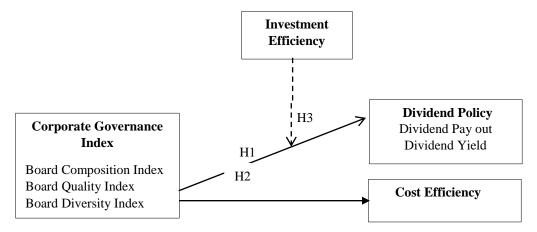
efficient investment policy consider their shareholder's wealth where corporate board belongs to diverse backgrounds. Hence we proposed the following hypothesis:

> *H3: Investment efficiency moderates the relationship between corporate governance index and dividend policy*

Theoretical and Conceptual Framework

In the recent literature, it is found growing relation of corporate governance index with dividend policy and firm efficiency. Our study extends the previous work by incorporating governance indices to investigate the dividend policy (wealth maximization) and cost efficiency (social welfare). In addition to this current study explore the interaction effect of investment efficiency between corporate governance indices and dividend policy of the corporate sector in the context of Pakistan. Based on our Hypotheses following model is proposed:

Figure 1. Conceptual Framework

Methodology

Data source and sample

To test our hypotheses 77 non-financial firms were selected from the KSE 100 index listed in the Karachi stock exchange (KSE). About eighty percent of the total market capitalization is represented by the select sample. The sample size covered eight years from 2012-19 and was obtained from the financial reports of the KSE firm (N=616). In the current study, we take dividend policy (dividend payouts and dividend yield) and cost efficiency as dependent variables, board composition index, board quality index, and board diversity index is taken as independent variables and investment efficiency is taken as moderating variable. Panel regression models are applied for the estimation of our model. Furthermore moderating effect was employed through a hierarchal regression model. From the above discussion the following model found:

$$DP_{it} = \beta_0 + \beta_1 BCI_{it} + \beta_2 BQI_{it} + \beta_3 BDI_{it} + \varepsilon_{it}$$
$$DY_t = \beta_0 + \beta_1 BCI_{it} + \beta_2 BQI_{it} + \beta_3 BDI_{it} + \varepsilon_{it}$$
$$CE_{it} = \beta_0 + \beta_1 BCI_{it} + \beta_2 BQI_{it} + \beta_3 BDI_{it} + \varepsilon_{it}$$
$$DP_{it} = \beta_0 + \beta_1 BCI_{it} + \beta_2 BQI_{it} + \beta_3 BDI_{it} + \beta_4 IE_{it} + \beta_5 (BCI * IE)_{it} + \beta_6 (BQI * IE)_{it} + \beta_7 (BDI * IE)_{it} + \varepsilon_{it}$$

$$DY_{it} = \beta_0 + \beta_1 BCI_{it} + \beta_2 BQI_{it} + \beta_3 BDI_{it} + \beta_4 IE_{it} + \beta_5(BCI * IE)_{it} + \beta_6(BQI * IE)_{it} + \beta_7(BDI * IE)_{it} + \varepsilon_{it}$$

Cost Efficiency

Cummins & Weiss (2013) explains the ability of a firm to produce an output from the best combination of inputs at given resources. The efficiency of a firm is gained by studying the firms that achieved efficient frontier by their best practices and are dominant in the industry. Data envelopment analysis is used to calculate the efficiency of the financial sector (Jaiyeoba et al., 2018). A score of cost efficiency for the corporate sector or non-financial firms is computed by non-parametric technique, data envelopment analysis (DEA) with variable returns to scale method (Tan et al., 2020). Linear programming method estimates the efficiency in the DEA method followed as:

$$\text{Optimum efficiency of 'X' unit} = \sum_{p=1}^{q} l_p m_{py}$$
$$\text{Maximum Efficiency of 'X' unit} = \sum_{p=1}^{q} l_p m_{py}$$

$$\text{Such that (i.e.)} \quad \sum_{i=1}^{q} z_i x_{iy} = 1$$
$$\text{Hence is} \sum_{p=1}^{q} l_a m_{ay} - \sum_{i=1}^{q} z_i x_{iy} \le 1, X = 1,2, \dots \dots n$$

$$l_q \ge \varepsilon, q = 1.2,3 \dots \dots n$$
$$l_q \ge \varepsilon, i = 1.2,3 \dots \dots n$$

Where z_i = weight of input I and x_{iy} = level of input I used by the unit l_p = weight of output p and m_{py} = level of output a produced by unit X ε = mall number up 10^{-6} which show that weight of inputs and outputs $\ne 0$

To calculate efficiency score of cost this study selects the inputs and outputs based on the production approach which assume that firms are typically offering product and services (Castiglione and infante, 2014). Here we assumed that

Y=outputs= net sales, while

X=Inputs= Total property (measured by the sum of plant and equipment) + Labor (measured by the total number of employees) + Operating expense (measured by the cost of goods sold, selling, and administrative expense)

Demirbag et al., (2016) explain that total output is measured through sales revenue of a firm and inputs obtained by summing up a total property, labor, and operating expenses. DEA approach assumes three inputs (Total property, Labor, and Operating expense) and one output (revenue) to calculate cost efficiency score (Ariff and Can, 2008; Cooper et al., 2002).

Investment Efficiency

The difference between actual and expected investment is measured as investment efficiency. The firm is being involved in over or under investment if the actual investment is higher or lower than the expected investment respectively (Biddle et al., 2009; Shen, Luo, and Huang, 2015). Estimation of expected investment is followed by (Chen et al., 2011; Richardson, 2006) investment expectation model for measuring investment efficiency. The proposed model is as follows:

$$INVESTMENT_{it} = \beta_0 + \beta_1 SALES\ GROWTH_{it-1} + \varepsilon_{it}$$

Where i= firm, t=time, Investment= Net increase in tangible and intangible scaled by total assets and sales growth expressed by rate of change in sales. Investment efficiency measured through residual error term ε_{it} of the model that is the difference between actual and expected investment. Higher the value of error term shows inefficient investment due to higher difference between actual and estimated values of investment and vice versa. At the first stage, we obtained the investment efficiency score from the residual of the above model. Then a second stage we assigned "1" for firms having efficiency less than fifty percent otherwise zero.

Measurement of variables

Variables		Measurement/Variable Definitions	
Dependent variables			
Dividend Payout (Asquith & Mullins, 1983).	**DP**	Annual dividends payout ratio	
Dividend Yield (Black & Scholes, 1974)	**DY**	Annual dividend paid to the shareholder	
Independent variables			
Board composition index (Bonn et al., 2004; W.M. Al-Ahdal et al., 2020)	**BCI**	Executive Directors	Total no. of none-independent directors
		None-Executive Directors	Total no. of Independent directors
		Board Size	Total no. of board members
		Board Duality	CEO also a Chairman
Board Quality index (Bansal & Sharma, 2016; W.M. Al-Ahdal et al., 2020))	**BQI**	No. of Board meetings	Total no. of annual meetings
		Audit meetings	Total no. of audit meetings
		Audit committees independence	No. of outside directors in Audit committee
		Audit Committee Members	Total no. audit committee members
Board Diversity index (Azam et al., 2019)	**BDI**	Gender diversity	Percentage of female directors
		Ethnic diversity	Percentage of foreign directors
		Educational Diversity	Average education of directors in terms of Bachelor=1, Masters/CA=2, and Ph.D. =3
		Caste Diversity	Percentage of directors mention cast with the sir name
Moderator			
Investment Efficiency	IE	1= if investment efficiency score ≥ 50%, otherwise =0	

Results and Findings
Descriptive Analysis

Table II presents the univariate analysis of all variables employed in the study. Mean, slandered deviation and the Pearson correlation between the variables are employed in the study. A significant and positive correlation between the diversity index and the dividend payout is found in the results. The same findings are repeated between dividend yield and diversity index. However, the board composition index is significantly and negatively correlated with dividend yield and payout. But cost efficiency is positively influenced by the board diversity index, hence

showing that diverse corporate boards focused on the shareholder's wealth as well consumer prices to enhance the social welfare, and in the case of board composition findings showed a negative association.

Table 2 Descriptive Analysis

Variable s	Mean	SD	DP	DY	CE	BCI	BQI	BDI
DP	12.704	31.627	1.000					
DY	0.1338	0.1653	.209***	1.000				
CE	0.1228	0.2003	.034	.042	1.000			
BCI	0.0038	1.0018	-.129***	-.087***	-.085***	1.000		
BQI	0.0037	1.0039	-.074	.009	-.054	.560***	1.000	
BDI	0.0286	0.9245	.333**	.232***	.053**	.044	0.90***	1.000

Notes: p-values significant at *p < 0.10; **p <0.05; ***p < 0.01; N=616

Panel Regression models

To investigate the relationship of board indices with dividend policy and cost efficiency panel regression models are employed for testing the hypothesis. The panel regression model was employed to check the endogeneity problem in the collected sample. Random and fixed-effect models were used to check the covariance between independent variables and the error term of the model. The null hypothesis of the Huasman test (*p-value> .05*) confirmed in Model I, II, and III that random effect is preferred over the fixed effect model (See Table II). A zero covariance between board indices (Board composition, board quality, and board diversity) and error term show that there is no endogeneity problem. Furthermore, the interaction effect of investment efficiency is investigated in the panel regression model (Table III). H_1 posited that the board index has a significant and positive association with dividend policy. Results have shown that the board diversity index is positively and significantly associated with dividends payouts and dividend yield in instances i.e pooled, fixed, and random effect models (*p-value< .05*). However, Board composition is significantly but negatively associated with dividend payout and yield (Model I & II, Table II). But board composition index is positively and significantly associated with the cost efficiency of the firm (Model III, Table II). It confirms our H_2 that postulates cost-efficiency association with board indices. Hence we conclude that a diverse board in the corporate in favor of shareholders wealth but consumer prices or the social welfare enhanced by the board composition index in the corporate board. Board quality has no significant association with dividend payouts, dividend yield, and cost-efficiency.

Table 2 Panel Regression

	Model I			Model II			Model III		
	DP (Dividend Payout)			DY (Dividend Yield)			CE (Cost Efficiency)		
Variables	PE	FE	RE	PE	FE	RE	PE	FE	RE
	β	β	β	β	β	β	β	β	β
Constant	0.143***	0.143***	0.143***	1.942***	1.9415***	1.888***	-	-	-2.908***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	2.8924***	2.878***	(0.000)
							(0.0000)	(0.0000)	
BCI	-0.023***	-0.035**	-0.028**	-0.0074	0.0506	0.0348	.05289***	0.3460*	0.4001**
	(0.005)	(0.0296)	(0.0156)	(0.8857)	(0.4828)	(0.5757)	(0.000)	(0.0700)	(0.0131)
BQI	0.001***	0.205	0.008	0.0702	0.0749	0.0691	0.1565	0.1147	0.1264

	(0.000)	(0.2582)	(0.4926)	(0.2232)	(0.4895)	(0.4121)	(0.1277)	(0.4816)	(0.3602)
BDI	0.031***	0.043***	0.038	0.3612***	0.1275**	0.1663***	0.2846**	0.0312	0.0641
	(0.000)	(0.000)	(0.000)	(0.0000)	(0.0199)	(0.0012)	(0.0151)	(0.7726)	(0.5341)
F-Stats.	10.46***	6.07***	9.32***	16.87***	21.39***	3.911***	8.8402***	16.66***	2.489*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.0595)
R-square	0.048	0.4735	0.0438	0.0926	0.7883	0.0233	0.0488	0.7348	0.0142
Adj. R Sq.	0.0442	0.3956	0.0391	0.0871	0.7514	0.0172	0.0433	0.6907	0.0085
Hausman Test			0.1367				0.2323		0.7172
			(5.5333)				(4.2847)		(1.3503)

Note : N=616 for all models; () denotes p-value at ***p<0.01, **p< 0.05, *p< 0.10, BQI=Board quality index, BDI= Board diversity index, BCI=Board quality index

Panel Regression with interaction effect

Furthermore, the interaction effect of cost efficiency between board indices and dividend policy investigates H_3. To eliminate the multicollinearity between interaction terms and independent variables standardized form of the variables obtained before result analysis (Aiken & West, 1994). From the below results it is found that investment efficiency positive moderates between board diversity index and dividend payout of the firm (H_3). The same results repeat for the association with dividend yield (*p-value< .05*). However, results are insignificant in the case of board composition and board quality index (*p-value>.05*). Board composition and board quality are unable to impact dividend payouts and dividend yield with interaction terms. See Table (III)

Table 3 Panel Regression with interaction effect

	Model I			Model II		
	DP (Dividend Payout)			DY (Dividend Yield)		
Variables	PE	RE	FE	PE	FE	RE
	β	B	β	β	β	β
Constant	0.1263**	0.1210***	0.1225***	0.09787***	0.1222***	0.1101***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BCI	-0.0108	-0.2689	-0.0172	0.0188	-0.0116	-0.0001
	(0.2770)	(0.1182)	(0.1588)	(0.3372)	(0.7318)	(0.9940)
BQI	0.0044	0.0155	0.0041	-0.0123	-0.0193	-0.0122
	(0.6430)	(0.4196)	(0.7489)	(0.1404)	(0.6134)	(0.6512)
BDI	0.0723***	0.0806***	0.0784***	0.0175	0.7154***	0.0488***
	(0.000)	(0.000)	(0.000)	(0.1619)	(0.000)	(0.0017)
IE	0.0366***	0.05767***	0.0503***	0.0336	-.0130	0.0100
	(0.0054)	(0.0044)	(0.0015)	(0.1890)	(0.7295)	(0.7471)
BCI×IE	-0.0249	-0.0142	-0.0188	-0.0413	0.0174	-0.0018
	(0.1227)	(0.4258)	(0.2457)	(0.1892)	(0.6030)	(0.9531)
BQI×IE	-0.0207	-0.0123	-0.0009	0.0046	-0.0016	-0.0012
	(0.1869)	(0.5100)	(0.9532)	(0.8794)	(0.9631)	(0.9702)
BDI×IE	0.0239*	0.1025***	0.0669***	0.0506***	0.0715***	0.0624***
	(0.0714)	(0.000)	(0.000)	(0.001)	(0.0017)	(0.0011)
F-Stats.	16.970***	6.3510***	9.0343***	2.3414***	5.225***	3.0329***
	(0.000)	(0.000)	(0.000)	(0.0230)	(0.000)	(0.0038)

R-square	0.1626	0.4991	0.0946	0.0268	0.4555	0.0344
Adj.R	0.1529	0.4205	0.0841	0.0153	0.3681	0.0230
Hausman		33.019				8.6409
Test		(0.000)				(0.2795)

Note : N=616 for all models; () denotes p-value at ***p<0.01, **p< 0.05, *p< 0.10

Hierarchical Regression Analysis

For further confirmation and robustness of results, the hierarchical regression model is estimated for the confirmation of results on the moderating effect of investment efficiency. Here we confirmed the interaction effect of investment efficiency between board indices and dividend policy (H3). Model II (DP) confirms that investment efficiency significantly and positively moderated between board diversity index and dividend payout (0.031<0.05). The same results are repeating for dividend yield in Model II (DY) (0.043<0.05) showing that dividend yield is also significantly explained by the diverse board in the corporate sector. In addition to its Model (DP), I & II found that firms that achieved efficient investment support to their shareholders in terms of high dividends payouts concerning the counterparts. We conclude that the increase in diversity in the board of directors leads to an increase in the shareholders' wealth. Conclusively both dividend payout and dividend yield are significantly supported by the board diversity. Hence it confirmed again our third hypothesis. (see table III)

Table 4 Hierarchical Regression

	Model I (DP)	Model II (DP)	Model I (DY)	Model II (DY)	
Main Effect					
Constant	0.144***	.142***	11.305	11.227	
	(0.000)	(0.000)	(0.000)	(0.000)	
BCI	-0.019***	-.022***	.392	.000	
	(0.015)	(0.006)	(0.799)	(1.000)	
BQI	-0.006	-.004	-1.176	-.983	
	(0.462)	(0.597)	(0.442)	(0.520)	
BDI	0.058***	.062***	2.749	1.844	**Table IV**
	(0.000)	(0.000)	(.030)	(0.169)	
IE	0.019**	.018***	1.723	1.636	Hierarchical
	(0.004)	(0.005)	(0.174)	(0.196)	Regression
Interaction Effect					
BCI×IE		-.012		-1.924	
		(.123)		(0.218)	
BQI×IE		-.010		.163	
		(.188)		(0.915)	
BDI×IE		.012**		2.738**	
		(.031)		(0.043)	

	R-square	R-square Change	F	Sig
Model I (DP)	0.114	0.114	25.550***	(0.000)
Model II (DP)	0.403	0.019	4.519***	(0.004)
Model I (DY)	.012	.012	1.853	.117

Model II (DY)	.024	.011	2.331*	.073

Note : N=616 for all models; () denotes p-value at ***p<0.01, **p< 0.05, *p< 0.10 respectively

Discussions

This study aims to explore the impact of the board composition index, board quality index, and board diversity index on dividend policy and cost-efficiency. In addition, the interaction effect of cost efficiency between corporate governance indices and dividend policy was also investigated. Panel model regression was employed on the relationship of governance indices with dividend policy and cost-efficiency. While hierarchical regression estimates the interaction effect of investment efficiency between governance indices and cost-efficiency. Our findings suggest that diverse board in corporate firms is a higher tendency to work for wealth maximization (H_1). However, they are not in the favor of consumer benefits by setting appropriate prices (cost efficiency). However, board composition is in favor of consumer benefits through cost-efficient production that enables consumers to pay the right prices (H_2). In contrast, wealth maximization is not supported by the board composition. More, specifically board composition is unable to support the Shareholder wealth in terms of dividends. In addition to board quality unable to support any of wealth maximization (dividend policy) or consumer benefits (cost efficiency). Furthermore, findings support the idea of investment efficiency leads to wealth maximization. Investment efficiency moderates the relationship between board diversity and dividend payout. In addition to its investment efficiency strengthen the relationship between Boards' quality and dividend yield (H_3)

The current study found a positive association between board diversity and dividend policy support the findings of (Gyapong et al., 2019; Almeida et al., 2020). (Byoun et al., 2016; Shehata, 2021) found a significant and positive association between board diversity and dividend policy (H_1). However, boards' composition has a negative and significant impact on the dividend payout but is positive and insignificant with dividend yield (Shahid, 2016). However, Board composition is positively associated with cost efficiency in the corporate sector of Pakistan (H_2). (Ali et al., 2021) found a significant and positive association between firm efficiency and the corporate board confirmed our results. However board quality has an insignificant association with both dividend policy and cost-efficiency of the corporate sector in our study.

Furthermore, the findings suggested that investment efficiency moderated the relationship between the board diversity index and dividend policy (H_3). A study found that investment efficiency promotes the wealth maximization shareholder through dividends confirmed our results (Min, 2010; Tran, 2020).

Conclusions

This research is limited to the demographical and geographical context. The investigation of the study is based on the geographical context of Pakistan. The sample is accounted for the listed firms in the Karachi stock exchange. The study is based on the board composition, quality, and diversity variables in the non-financial sector. Other board characteristics like family ownership, institutional ownership, government ownership, and the block holders' ownership were not included in the study. Further studies can be in the context of other demographics and geographic. Studies can employ the other board characteristics prominent in the corporate governance of emerging and developed countries. Moreover, further studies can construct an

ownership index to investigate dividend policy. Our proposed model can be applied in developing countries. Furthermore, additional moderations like profit efficiency and technical efficiency can be included.

Managerial Implications

The present study includes the governance indices like boards' composition, boards' Diversity, and boards' quality. The results suggest that the corporate sector of Pakistan must promote diversity in the board of directors in developing policies to care about their shareholders. Policymakers must focus on the composition of corporate boards to enhance the cost efficiency of a firm for the care of the ultimate consumer. Furthermore, the corporate sector in Pakistan focused on the alleviation of investment efficiency that helps in mitigating agency problems while developing a dividend policy.

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