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Corporate Governance Implications of Family Firms: Evidence from Pakistan

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Abstract:

Previous studies have shown that various factors of corporate governance interact with one another to affect business performance in a non-linear manner. Hence, to have a clear insight, the performance of family firms is examined at different levels of board independence and audit committee independence. The beauty of the method used in this study is that suitable combinations of corporate governance mechanisms to achieve utmost performance can be identified. Thus, conducting step-wise regression through the dynamic GMM model, we found that for effective monitoring of managerial financial reporting choices and investment decisions of family firms, the proportion of independent directors on the board should be at least 60%. However, the proportion of independent directors on the audit committee that is less (or greater) than 66% increases financial reporting quality and decreases investment inefficiency.

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1.0 Introduction

Family-owned type businesses dominate the world economic landscape (Villalonga and Amit, 2020). These firms include both publicly listed corporations and privately held companies. Characteristically, the owners of family firms hold senior management positions and are long-term investors in businesses, hence control usually involves less in assets diversification(Anderson and Reeb, 2003).Existing empirical literature focusing management of a family firm and its dynamics supports a close association between family involvement in corporate governance practices and firm performance (Deniz et al., 2020). Despite that factors of corporate governance have much theoretical support and empirical significance, their effect in enhancing firm performance in various contexts is not always assured as documented by previous literature (for example, Fuzi et al., 2016).

Generally, corporate governance includes country-specific and firm-related governance factors. Studies pertaining to a single country do not analyze country-related factors due to the existence of a uniform regime for companies of the country. However, studies conducted in specific contexts (For example, Chahine and Filatotchev, 2008; Christensen et al., 2010; Knyazeva et al., 2013;Bertoni et al., 2014; Liu et al., 2015 and Puni and Anlesinya, 2020)concluded that micro-level mechanisms of corporate governance (such as concentrated ownership, board of directors, and audit committee) increase firm performance. It should also be noted that a stringent governance structure either at the country or firm level is not always a suitable solution. Rather excessive governance sometimes worsens the firm performance. In this respect, numerous empirical studies (For example Anderson et al., 2012; Maseda et al., 2019; Kong et al., 2020 and Tleubayev et al., 2021) showed a non-monotonic relationship between corporate governance and firm performance. Similarly, Gillan et al. (2003) argued that a strict system of corporate governance is not always optimal. Rather they observed a tradeoff between the cost and benefits of corporate governance.

Mainly country's legal regime determines protection for investor rights. In this respect, La Porta et al. (1999) preferred countries with common law origin due to their more efficient judicial system than that of civil law countries which signifies more rights for investors of the former system. Once country-level regulations are designed thereafter it is needed to study interactions among corporate governance mechanisms of the firm so that the optimal combination of these provisions leading to improved performance can be identified. To do so board independence and audit committee independence used as corporate governance mechanisms are studied in relation to financial reporting quality and investment inefficiency of family firms. By doing so we contribute to empirical literature as follows: First researchers view that family owners manage firms in two different ways. For example, Bjuggren and Palmberg (2010),Bhatt and Bhttacharya (2015), and Ghaleb et al., (2020)showed that family ownership work as a monitoring mechanism of corporate governance. However, others (For example, Yang, 2010; Ding et al., 2011; De Cesari, 2012 and Yousaf et al., 2019) have different views that owners of family firms expropriate the wealth of minority shareholders. Thus against the said backdrop, this study will revisit two opposite views on the nature of family firms in operating business in Pakistan where the common law regime does not exist in pure form but is mixed with customary law and religious law (Orucu, 2008). Thus Pakistan's legal system is unique to study family firms in a corporate governance context where family members besides equity ownership hold senior management positions (Ibrahim, 2006).Second, directors of the board, as well as the audit committee, are important appointments that ensure quality financial reporting and efficient investments (Peasnell et al., 2005; Crutchley et al., 2007; Pucheta-Martínez and García-Meca, 2014; Bravo and Reguera-Alvaredo, 2017 and Bzeouich et al., 2019). To increase transparency, the required proportion of independent directors on boththe board and audit committee was increased in the Pakistan corporate governance code 2012. Thus exploring optimal proportions of independent directors of board and audit committee has policy implications for family firms in Pakistan. Third, examining the determinants of financial reporting quality and efficient investment is important since good quality reports assist various stakeholders of firms to make accurate decisions (McNichols and Stubben, 2008). Moreover, efficient investments at a firm level have macroeconomic implications (Biddle et al., 2009).

The remaining paper is organized into the following sections: Section 2 delineates literature relevant to the issue. Section 3 is meant for variables description, measurement of variables, and econometric methodology. The results of the study and conclusion are elaborated in sections4 and 5 respectively.

2.0 Literature Review

The enactment of best corporate governance practices can effectively enhance the growth of a company in various ways. For example, firm governance structure assists it by improving corporate image, boosting investors confidence, and reducing fraud (OECD, 2004). As suggested by the Agency theory, the board performs a monitoring function within the context of corporate governance(Fama and Jensen, 1983). It is necessary to monitor management because, without proper supervision, managers do not perform their duties in the best interest of stockholders and hence hide true financial information (Pergola and Verreault, 2009).The board has various characteristics such as size, composition, and remuneration. Among these, previous studies have related the composition of the board to various firm performance measures (Liu et al., 2015). In this respect, many studies (for example: Jaggi et al., 2009; Yekini et al., 2015 and Porter and Sherwood, 2023 among others) showed that independent board directors effectively supervise the preparation of financial reports.

During business, the board assigns various supervisory duties to the audit committee of a firm. Apart from this fact, it is considered important to study the role of the audit committee because its independent directors ensure investor's confidence (Leung et al., 2014).As observed by Lin and Hwang (2010),the audit committee helps the management of a firm in enforcing corporate governance systems and as suggested by Ismail et al. (2008),the inclusion of independent directors increases the effectiveness of the audit committee. Further, Darus and Mohamad (2011) argued that independent directors can improve the capability of the audit committee. Furthermore many researches particularly (for example, Klein, 2002; Crutchley et al., 2007; Siagian and Tresnaningsih, 2011; Salehi and Shirazi., 2016 and Saona et al., 2020) empirically confirmed the stance that financial reporting quality increases with the appointment of outside directors on the audit committee.

Other relevant literature shows that corporate governance factors are less effective when employed separately. Therefore to report the utmost performance, the effect of two or more factors should be considered simultaneously. The proponents of this view(See please, Morck et al., 1988; Bozec and Bozec, 2007 and Pant and Pattanayak, 2007) usually study concentrated ownership along with other attributes of the board. In contrast to the USA and UK, where ownership structures are dispersed, the majority of firms in Asian countries are family-owned (Claessens and Fan, 2002). Like other Asian countries, in Pakistan most companies are held closely by the family. Due to large equity ownership, family owners succeed to acquire key management positions. Therefore, it is assumed that such family ownership may influence important decisions of firms (Javid and Iqbal, 2010). Resultantly such inside owners decrease the board's monitoring function (Jensen and Meckling, 1976). In the same vein, Jaggi et al. (2009) found decreased monitoring role of directors when family owners become members of the board. Similarly, Pantand Pattanayak (2007) observed that the entrenchment effect of major shareholders is a function of their equity ownership. Many studies (For example, Yeo et al. 2002; Sanchez-Ballesta and Garcia-Meca, 2007 and Gonzalez and Garcıa-Meca, 2014) showed that earnings informativeness decreases with internal ownership. Jaggi and Leung (2007) observed that the effectiveness of audit committees decreases in cases where there are dominant family members on the boards. Wong (2011) found that audit committee of family firms are less independent and had less financial expertise. Al-Absy et al. (2019) identified that a board whose chairman is a family member decreases the effectiveness of an audit committee in overcoming the earnings management problem. In line with previous studies (e.g., Aguilera et al., 2008; Tosi, 2008; Ward et al., 2009; Kim & Lu, 2011; and Schepker & Oh, 2013), we assume that corporate governance mechanisms (in our case, family ownership, board independence, and audit committee independence) combine in complex ways to either increase or decrease financial reporting quality.

H_1(a). The effect of increasing the number of independent directors on the board on the financial reporting quality of family firms changes with the level of board independence.

H_1(b). The effect of increasing the number of independent directors of the audit committee on the financial reporting quality of family firms changes with the level of audit committee independence.

It has been empirically confirmed that sufficient capital and dedicated management are prerequisites of efficient investment (Chen et al., 2017). Thus independent board members affect investment efficiency in two ways. First, directly through the resource provisioning function of the independent board as theorized by resource dependence theory (See please, Zahra and Pearce, 1989; Certo, 2003).In this respect studies (For example, Gompers, 1995; Certo et al., 2001 and Chen, 2013) showed that non-executive directors attract potential investors that result in raising external capital for the firm. Second, the channel through which independent directors are associated with investment efficiency is monitoring managerial reporting choices as promulgated by agency theory. These reports in turn result inefficient investments (Bushman and Smith, 2001). In this respect, Schipper and Vincent (2003) argued that information accuracy is crucial for firms as it affects the investment decisions of investors. In this way, Liu et al. (2015) empirically confirmed China where independent directors of the board reduced the self-serving behavior of management and thus improved the investment efficiency of firms.

Another corporate governance factor affecting investment efficiency is audit committee independence. Swamy (2011) argued that independent audit committee members improve the efficiency of the auditing process. Al-Matari et al., (2014) empirically showed that audit committee independence and Tobin's Q are positively associated. Similarly, independent directors in the audit committee ensure accountability that enhances the performance of firms (Fariha et al. 2021). The independent audit committee affects the investment efficiency of firms in various ways. To this end, Anderson et al. (2004) observed that the cost of debt decreases with increasing independent directors proportion of the audit committee. They found that the cost of debt of firms having audit committees that included only independent directors is 15 % less than that of firms with audit committees otherwise. Likewise, Ashbaugh et al. (2004) argued that monitoring management increases the investment efficiency of firms. They found that the cost of equity of firms with a majority of independent directors in the audit committee is low. Also,

Johnson et al. (2000) showed that the low cost of equity and debt increases investment efficiency.

The independent directors of family firms are usually not free in their decisions due to the influence of family board members but support unconditionally to protect family interests (Chen and Jaggi, 2000).Likewise, Nguyen et al. (2017) observed that independent directors do not effectively monitor management when shares are owned by major shareholders. Similarly, Morck et al.(1988) showed that directors' ownership has a non-monotonic relationship with firm performance. Pant and Pattanayak (2007) found that the Q ratio first increases then decreases and thereafter increases again with the increase in inside ownership. Singam (2003) argued that ownership concentration diminishes positive effects of corporate governance mechanisms, thereby decreasing firm performance. Al-Hadal et al. (2023) argued that family owners can decrease monitoring functions of the board. Lam and Lee (2012) found that family ownership negatively affects the association between board committees and firm performance. The following testable hypotheses are developed based on the nature of the relationship between variables of the study: We assume that corporate governance mechanisms, namely family ownership, board independence, and audit committee independence, interact to either increase or decrease investment efficiency.

H_2(a). The effect of increasing the number of independent directors on the board on the investment efficiency of family firms changes with the level of board independence.

H_2(b). The effect of increasing the number of independent directors of the audit committee on the investment efficiency of family firms changes with the level of audit committee independence.

3.0 Methodology

To get data for analysis of certain relationships between selected variables, we used non-financial family companies which a reregistered on the Pakistan Stock Exchange (PSX) over the years from2008 to 2016. However, an extended period starting from 2001is used to calculate

some variables. Following Shahzad et al. (2019) we considered a firm as family-owned if 50% or more of its equity is owned by members of a family. Out of family firms, we chose only non-financial firms as Biddle et al. (2009) argued that a financial firm invests in different assets than a non-financial firm. For example, financial companies invest in financial assets whereas non-financial firms invest in capital assets. To collect data on specific variables of non-financial family firms two sources were used. First, the annual report of companies and second the database of Banker Thomson DataStream.

3.1 Measurement of Variables

We have followed Hermalin and Weisbach (1991) to categorize both board independence (BoardInd) and audit committee independence (AuditInd). In this connection, BoardIndL40 is the proportion of independent directors on the board if this number is less than 0.40 and 0.40 otherwise. BoardInd4060 is the proportion of independent directors on the board minus 0.01 if the proportion is greater than 0.40 and less than 0.60, otherwise 0. BoardIndG60 is the proportion of independent directors on the board minus 0.60 if the proportion is greater than 0.60, and 0 otherwise. Likewise, categories of audit committee independence are constructed. AuditIndL66 is the proportion of independent directors in the audit committee if this proportion is less than 0.66 and 0.66 otherwise. AuditIndG66 is the proportion of independent directors in the audit committee minus 0.66 if the proportion is greater than 0.66, and 0 otherwise.

Other variables used are the index of financial reporting quality (FI)and investment inefficiency (Inv_Inefficiency). To construct the index, we followed Leuz et al. (2003) and used company rankings for various earnings quality attributes. As a first step, we ranked companies yearly with respect to each attribute. In the second step, these ranks were used to construct the financial reporting quality index. Measurement of various earnings quality attributes are as follows: For example, accruals quality has two proxies which are calculated as given in Equation (1) and Equation (2) respectively.

$$\text{Asset side accruals quality}_{i,t} = \frac{\text{Absolute change in current assets}_{i,t}}{\text{Total assets}_{i,t}} * (-1) \quad (1)$$

$$\text{Liability side accruals quality}_{i,t} = \frac{\text{Absolute change in total liabilities}_{i,t}}{\text{Total assets}_{i,t}} * (-1) \quad (2)$$

In Equation (1) current assets exclude cash and short-term investments. Subscripts i and t used are for firm and year respectively. We multiply both ratios by -1 as higher use of accruals shows low earnings quality.

We followed Francis et al. (2004) to calculate the other attributes. For example, this study used the autoregressive model given in Equation (3) with 8 years windows to measure the predictability and persistence of earnings.

$$\frac{\text{Net income}_{i,t}}{\text{Total assets}_{i,t}} = \beta_1 + \beta_2 \frac{\text{Net income}_{i,t-1}}{\text{Total assets}_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

The predictive ability is the negative of the square root of the variance of the residuals of Equation (3). We made a negative of the measure as the lower value of it shows a higher ability of current earnings to predict future earnings. Similarly, the slope coefficient (β_2)shown in Equation (3) is meant to measure earnings persistence. Such as a higher value of $\beta_2$represents persistent earnings while a lower value of it shows transitory earnings.

Equation (4) is used to calculate earnings smoothness.

$$\text{Smoothness}_{i,t} = \frac{\sigma(\text{Cash flow from operations}_{i,t}/\text{Total assets}_{i,t-1})}{\sigma(\text{Net income}_{i,t}/\text{Total assets}_{i,t-1})} * (-1) \quad (4)$$

The smaller values of the ratio show higher financial reporting quality while the larger value indicates low quality of financial reporting. That's why we used the negative of the ratio to measure the smoothness.

We measured value relevance as the adjusted R-square of Equation (5).

$$\text{Return}_{i,t} = \beta_1 + \beta_2 \text{Net income}_{i,t} + \beta_3 \text{Change in net income}_{i,t} + \varepsilon_{i,t} \quad (5)$$

Timeliness and conservatism are measured through Equation (6) .

$$\text{Net income}_{i,t} = \beta_1 + \beta_2 \text{Neg}_{i,t} + \beta_3 \text{Return}_{i,t} + \beta_4 \text{Neg}_{i,t} * \text{Return}_{i,t} + \varepsilon_{i,t} \quad (6)$$

In Equation (6), $Neg = 1$if $Return < 0$,and0 otherwise. Timeliness is the adjusted R-square value of Equation (6).For conservatism, we used the following Equation (7):

$$\text{Conservatism}_{i,t} = \frac{\beta_{3,i}+\beta_{4,i}}{\beta_{3,i}} \quad (7)$$

Where "$\beta_{3,i} + \beta_{4,i}$" and "$\beta_{3,i}$" are the coefficients on bad and good news respectively.

Another variable used is investment inefficiency (Inv_Inefficiency). Following Biddle et al., (2009) it is measured by estimating Equation (8) through ordinary least squares (OLS) for each industry and year with at least 10 observations.

$$\text{Investments}_{i,t} = \beta_1 + \beta_2 \text{Sales growth}_{i,t-1} + \varepsilon_{i,t} \quad (8)$$

Where *Investments* are the sum of annual capital expenditures and R & D expenditures less the sale of PPE. *Sales growth* is the increase or decrease in annual sales of a firm. We took absolute values of residuals of Equation (8)to calculate inefficient investments (Chen et al., 2011).Apart from the main variables, the control variables of the study are firm size (FSize) which is a natural log of total assets, Leverage (LEV) which is the ratio of total debt to total assets and MTB which is the market value of equity divided by book value of equity.

3.2 Penalty for Bottleneck Methodology

In this study, we have used the Penalty for bottleneck methodology to calculate the index of financial reporting quality. The beauty of this technique is that it balances out and optimizes factors of indices by identifying bottlenecks. In a broad sense bottleneck is a low-performing constituent of a system. Looking from a configuration perspective, Bottleneck methodology implies that a quality index can be constructed if its variables have the same values. Financial reporting quality depends on multiple attributes which interact with each other. Therefore we suggest that if these factors are out of balance, the development of a good-quality reporting index is inhibited. Using the Bottleneck methodology, the index is constructed in the following way:

First, we normalize the values of variables of the index using Equation (9).

$$X_{i,v} = \frac{z_{i,v}}{\max z_{i,v}} \quad (9)$$

In Equation (9), $v = 1 \ldots k$ number of variables,$x_{i,v}$ is the normal value of firm i and variable v,$v_{i,v}$ isthe original value of firm $i$andvariable v, andmax $z_{i,v}$ is the highest value for variable v.To equate the average values of the variables we transformed the $x_{i,v}$values such that these values lie in the range extended from 0 upto 1, given in Equation (10):

$$y_{i,v} = x_{i,v}^{w} \quad (10)$$

Where w is the "strength of adjustment", $w - th$ moment of X, v is the required average, yv. For w,we find the root of the Equation (11).

$$\sum_{i=1}^{n} x_{i,v}^{w} - n\bar{y} = 0 \quad (11)$$

We used the penalty function to calculate indicator-adjusted Bottleneck values, given in Equation (12).

$$h_{(i),v} = \min y_{(i),v} + [1 - e^{-(y_{(i),v} - \min y_{(i),v})}] \quad (12)$$

In Equation (12), $h_{i,v}$is the adjusted Bottleneck value of variable v of the company *I* and

$y_{i,v}$is the normalized value of index component v of the company i.

$y$minis the lowest value of $y_{i,v}$for the company $i, i = 1, 2, 3 \ldots n$= the number of companies, and $v = 1, 2, 3. \ldots . m$= the number of variables.

The value of the index for any company is the average of Bottleneck-adjusted variables of the index, multiplied by 100.

3.3 Model Estimation

For estimating financial reporting quality, we followed Hermalin and Weisbach (1991) and Wang (2006). Similarly, the investment inefficiency equation is specified following Hermalin and Weisbach (1991), Biddle et al. (2009), and Lara (2015). In this respect, we formulate Equation (13) and Equation (14).

$$FI_{i,t} = \alpha_1 + \alpha_2 BoardIndL40_{i,t} + \alpha_3 BoardInd4060_{i,t} + \alpha_4 BoardIndG60_{i,t} + \alpha_5 AuditIndL66_{i,t} + \alpha_6 AuditIndG66_{i,t} + \alpha_7 Inv\_Inefficiency_{i,t} + \sum_{i=1}^{3} Control_{i,t} + \varepsilon_{i,t} \quad (13)$$

$$Inv\_Inefficiency_{i,t} = \beta_1 + \beta_2 BoardIndL40_{i,t} + \beta_3 BoardInd4060_{i,t} + \beta_4 BoardIndG60_{i,t} + \beta_5 AuditIndL66_{i,t} + \beta_6 AuditIndG66_{i,t} + \beta_7 FI_{i,t} + \sum_{i=1}^{3} Control_{i,t} + \varepsilon_{i,t} \quad (14)$$

The $Inv\_Inefficiency$ is an inefficient investment of a firm and is used as a factor affecting reporting quality. In support of this, Hope et al. (2013) asserted that management, keeping in view current year performance, smooth earnings to get consistent earning figures. In Equation (14), we have used the financial reporting quality index (FI) as one of the explanatory variables following Biddle et al. (2009).

Other control factors affecting financial reporting quality positively include firm size. The larger firms are involved less in earnings management due to high scrutiny by authorities (Xie et al., 2003). Apart from this Bartov et al. (2000) found that market to book ratio positively affects financial reporting quality. Similarly, high-levered firms have low financial reporting quality. Since low firm performance (low market-to-book ratio) and more leverage are associated with higher bankruptcy risk which further increases litigation risks. With these facts, low-performance firms having high leverage manipulate earnings. The firm size also affects investment efficiency. Biddle and Hillary (2006) argued that larger firms would be more transparent, therefore, the investment efficiency of larger firms will be different from those of smaller firms. The leverage is a firm-specific factor that forces firms to underinvest since high-leverage firms face debt overhang problems (Biddle et al., 2009).

3.4 Econometric Method

Ordinary least square (OLS) is a simple approach to predict the marginal effect on the outcome variable due to explanatory variable(s). However,OLS estimates are only BLUE (Best linear unbiased estimates) when various assumptions are fulfilled before hand. Among these, one of the assumptions is no endogeneity that is explanatory variables and error terms are not correlated. In the case of endogeneity,OLSproduces biased and inefficient estimates. In our case, financial reporting quality and investment inefficiency affect each other simultaneously which can cause endogeneity (Wintoki et al., 2012). Therefore to avoid endogeneity, we have used the Generalized Method of Moments (GMM) model for the estimation of equations by following Schultz et al.,(2010).

4.0 Results

This portion of the paper is all about the discussion on the results of the study.

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4.1. Discussion on Descriptive Statistics

As depicted in Table 4.1, the mean value of $BoardInd$ and$AuditInd$ are 0.623 and 0.844 respectively. Thus both the board and audit committee, on average have more than 50% independent directors representation. Further, both $BoardInd$ and $AuditInd$ have a maximum value of 1 which shows that the sample includes firms having a 100% independent directors on the board and audit committee. Some firms have no representation of independent directors as $BoardInd$ and $AuditInd$ have 0 minimum values. The mean value of FI is 40%. Whereas the lowest value of the said index is 16.4% and the highest value is 71.9%. The mean value of $Inv_Inefficiency$is 0.051, whereas its minimum value is0.The 0 value of $Inv\_Inefficiency$ shows efficient investment whereas values greater than 0 correspond to inefficient investments.

4.2. Discussion on Correlation Analysis

As shown in Table 4.2, the lower level of board independence ($BoardIndL40$) and a moderate level of board independence ($BoardInd4060$) are negatively correlated with*FI*. Similarly, a higher level of board independence ($BoardIndG60$) is positively correlated with *FI*. However, only the correlation between a moderate level of board independence (BoardInd4060) and *FI* is significant. Both the lower level of audit committee independence ($AuditIndL66$) and a higher level of audit committee independence ($AuditIndG66$) are negatively correlated with *FI*. However, the correlation between these variables is not significant. Both a lower level of board independence ($BoardIndL40$) and a higher level of board independence ($BoardIndG60$) are negatively correlated with $Inv\_Inefficiency$. A moderate level of board independence ($BoardInd4060$), a lower level of audit committee independence ($AuditIndL66$), and a higher level of audit committee independence ($AuditIndG66$) are positively correlated with$Inv_Inefficiency$. FI is positively correlated with$Inv_Inefficiency$. However, none of the correlations is significant.

Table 4.1. Descriptive Statistics

Variable	Mean	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Observations
$BoardInd$	0.623	1	0	0.209	-0.935	3.369	1309
$AuditInd$	0.844	1	0	0.193	-1.113	4.601	
FI	0.401	0.719	0.164	0.090	0.348	3.027	

$Inv\_Inefficiency$	0.051	1.198	0	0.078	6.612	66.864	
$FSize$	8727.366	301316.4	101.621	18626.53	7.112	81.252	
LEV	0.583	0.998	0.017	0.214	-0.250	2.581	
MTB	1.045	83.091	0.031	3.008	18.644	461.419	

Table 4.2. Correlation Analysis

Variable	$BoardIndL40$	$BoardInd4060$	$BoardIndG$	$AuditIndL66$	$AuditIndG66$	FI	$Inv\_Inefficiency$	$FSize$	LEV	MTB
$BoardIndL40$	1.000									
$BoardInd4060$	0.207***	1.000								
$BoardIndG60$	0.323***	-0.551***	1.000							
$AuditIndL66$	0.365***	0.031	0.120***	1.000						
$AuditIndG66$	0.118***	-0.139***	0.184***	0.202***	1.000					
FI	-0.015	-0.055**	0.012	-0.017	-0.021	1.000				
$Inv\_Inefficiency$	-0.035	0.018	-0.007	0.001	0.012	0.042	1.000			
$FSize$	-0.133***	-0.029	-0.088***	-0.154***	0.021	0.049*	-0.001	1.000		
LEV	-0.021	0.046*	-0.024	0.010	-0.066**	-0.013	-0.008	-0.157***	1.000	
MTB	-0.030	-0.027	0.008	0.005	-0.008	0.049*	0.013	0.064**	0.030	1.000

4.3. Discussion on piecewise regression results

Results of the piecewise GMM model, exploring the non-linear relationship between board independence, audit committee independence, financial reporting quality, and investment inefficiency are discussed in the following subsections.

4.3.1. Discussion on financial reporting quality results

Table 4.3reports the results of the financial reporting quality index (FI). Our first variable of interest is $BoardIndL40$, which shows that at the level of board independence of less than 40%, the financial reporting quality index (FI) decreases with board independence ($\beta = -0.290, t = -2.956$). The marginal effect ($\beta = 0.131, t = 3.996$) of additional board independence is positive at a moderate level of board independence ($BoardInd4060$). Finally, coefficient for the highest level of board independence ($BoardIndG60$) is 0. 0.245, which is significant at a 5% level of significance. Thus, the marginal effect of increasing board independence on financial reporting quality is highest for the level of board independence greater than 60%.

The coefficient of $AuditIndL66$ shows that at the level of audit committee independence of less than 66%, financial reporting quality (FI) increases with audit committee independence ($\beta =$

$0.157, t = 2.179$). The coefficient of a higher level of audit committee independence (AuditG66) is negative that is, -0.178 which is significant at a 1% level of significance. On the part of control variables, investment inefficiency ($Inv\_Inefficiency$) is insignificantly and positively correlated with the financial reporting quality index. The firm size ($FSize$) is significantly and positively related to the financial reporting quality index (FI).While the leverage (LEV) is negatively correlated with the financial reporting quality index (FI) however the relationship is insignificant. The MTB ratio (MTB) is significantly and negatively related to the financial reporting quality index (FI).

4.3.2. Discussion on investment inefficiency results

Table 4.4 reports the results on the investment inefficiency ($Inv\_Inefficiency$). The coefficient of $BoardIndL40$ is significantly positive (β= 1.456, t= 5.528). It shows that at a level of board independence of less than 40%, investment inefficiency ($Inv\_Inefficiency$) increases with an increase in board independence. The coefficient of moderate level of board independence ($BoardInd4060$) is positive (β= 0.292) and significant at the 1% level of significance. Similarly, the coefficient for the highest level of board independence ($BoardIndG60$) is -1.606 and is significant at the 1% level of significance. The coefficient of $AuditIndL66$ is 1.420 which is significant at the 1% level of significance. Further, the coefficient of a higher level of audit committee independence ($AuditIndG66$) is -0.378 which is significant at a 1% level of significance. The results on control variables of investment inefficiency ($Inv\_Inefficiency$) showed that the financial reporting quality index (FI) significantly decreases investment inefficiency of family firms. The firm size ($FSize$) and MTB ratio (MTB) significantly increase investment inefficiency. The leverage (LEV) negatively affects investment inefficiency however the relationship is found insignificant.

Table 4.3: Results of Panel GMM regression of financial reporting quality index

Variable	Coefficient	t-statistic
$FI(-1)$	0.343^{***}	17.036
$BoardIndL40$	-0.290^{***}	-2.956
$BoardInd4060$	0.131^{***}	3.996

$BoardIndG60$		0.245**	2.315
$AuditIndL66$		0.157**	2.179
$AuditIndG66$		-0.178***	-2.964
$Inv\_Inefficiency$		0.003	0.745
$FSize$		0.096***	5.271
LEV		-0.030	-0.875
MTB		-0.014***	-3.961
J-statistic	120.996	p value	0.185

Note: Variables are defined similar to Table 4.2. **, *** denote significance at 0.05 and 0.01 levels respectively. Table 4.2 estimates the model $= \alpha 1 + \alpha 2 BoardIndL40_{i,t} + \alpha 3 BoardInd4060_{i,t} + \alpha 4 BoardIndG60_{i,t} + \alpha 5 AuditIndL66_{i,t} + \alpha 6 AuditIndG66_{i,t} + \alpha 7 Inv\_Inefficiency_{i,t} + \sum_{i=1}^{3} Control_{i,t} + \varepsilon$

Table 4.4: Results of Panel GMM Regression of investment Inefficiency

Variable		Coefficient	t-statistic
$Inv\_Inefficiency(-1)$		0.081***	22.470
$BoardIndL40$		1.456***	5.528
$BoardInd4060$		0.292***	4.666
$BoardIndG60$		-1.606***	-13.579
$AuditIndL66$		1.420***	7.342
$AuditIndG66$		-0.378***	-4.209
FI		-0.161***	-2.895
$FSize$		0.374***	9.540
LEV		-0.047	-0.703
MTB		0.046***	11.749
J-statistic	136.765	p value	0.393

Note: Variables are defined similar to table 4.2. *** denote significance at 0.01 level. The Table 4.3 estimates the model

$$Inv\_Inefficiency_{i,t} = \beta 1 + \beta 2 BoardIndL40_{i,t} + \beta 3 BoardInd4060_{i,t} + \beta 4 BoardIndG60_{i,t} + \beta 5 AuditIndL66_{i,t} + \beta 6 AuditIndG66_{i,t} + \beta 7 FI_{i,t} + \sum_{i=1}^{3} Control_{i,t} + \varepsilon$$

5.0 Conclusion, Implications, and Future Research Direction

The results on piecewise regression show that the relationship between corporate governance, financial reporting quality, and investment inefficiency is non-linear. For example, when the level of board independence is less than 40%, financial reporting quality decreases with board independence. The effect of further inclusion of independent directors at a moderate level of board independence between 40% and 60% becomes positive. However, the highest marginal effect of additional board independence is observed at a level of board independence greater than 60%. Further, the increase in audit committee independent directors at a level less than (or greater than) 66% proportion enhances (or deteriorates) financial reporting quality. Thus regarding financial reporting quality, optimal corporate governance for the family firms can be achieved at a level of board independence when it is greater than 60% and when the level of audit committee independence is less than 66%.

When the level of board independence is less than 40%, investment inefficiency increases with an increase in board independence. While at a moderate level of board independence between 40% and 60%, the investment inefficiency increases with an increase in board independence but at a lower rate than at the level of board independence of less than 40%. On the other hand, increasing board independence at a level greater than 60% decreases investment inefficiency. At the level of audit committee independence less than (greater than) 66%, investment inefficiency increases (or decreases) with increasing audit committee independence. Thus, this ensures optimal corporate governance for family firms that may affect investment inefficiency and may be achieved at a level of board independence that is greater than 60% and at a level of audit committee independence that is greater than 66%.

In line with previous studies examining the effectiveness of bundling various corporate governance mechanisms (e.g., Misangyi and Acharya, 2014; Tang et al., 2020; García-Sánchez et al., 2021), we show that corporate governance mechanisms, namely family ownership, interact with governance factors of board independence and audit committee independence in affecting financial reporting quality and investment inefficiency. Family ownership complements the above 40% proportion of board independence and the below 66% proportion of audit committee

independence in affecting financial reporting quality. However, the highest complementation effect for board independence is seen when it is composed of more than 60% independent directors. On the part of investment inefficiency above 60% proportion of board independence and above 66% proportion of audit committee independence are core conditions for decreasing investment inefficiency of family firms.

This study has certain limitations, hence following suggestions are formulated. As in this study, the index of financial reporting quality is constructed using only quantitative measures of earnings quality. Therefore, it will be interesting if future research incorporates qualitative attributes of earnings to construct the index. The accruals quality should be calculated based on individual asset-wise accruals and liability-wise accruals. Other governance variables not included in this study should be studied. As variables on the board are its size, proportion of executive directors on the board, and directors' fees, and variables on the audit committee are its size and proportion of internal directors in the audit committee. Inefficient investment is either underinvestment or overinvestment. The relationship between both underinvestment and overinvestment and other variables of the study should be examined.

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