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Investigating the Connection Between Investment Efficiency and Firm Value: Board Independence as a Moderator for Non-Financial Firms of Pakistan

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	Abstract
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Keywords:	Pakistan; Firm Value; board independence; Investment Efficiency



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Introduction

All financial operations involve valuation, which is crucial to the best possible capital allocation. One of the most important and intricate economic topics in many nations is company valuation. Investment banks and investment consultants use industry-specific standards to estimate a company's value in both established and developing nations with sophisticated capital markets. Investors and financial analysts have always found it difficult to evaluate a corporation's worth and the aspects influencing it in the capital markets. They try to ascertain the aspects that affect the value of the company. Investment efficiency is a key component in determining the worth of a company. The desire to own a firm and get dividends or capital gains is what drives investors to finance in the stock market. The investors will consider the firm value and acceptable stock returns before making an investment.

The agency problem is a barrier to reaching the objective, even though a greater stock price equates to a larger business value, and a higher firm value will boost revenue for shareholders (Suhadak et al. 2019; Husnan 2012).

Taking into consideration the information gap that occurs among owners and managers as well as the idea of signaling, accounting can be seen as an instrument that facilitates the flow of appropriate and important internal information of an organization to the outside of the business. This leads to signaling about the company's value, performance, and competitive advantage (Gumanti 2011) and improve investor decision-making (Vu 2020).

Enhancing investment efficiency also reduces investment distortion. The worth of the business rises because in a market that is ideal, any project that has a positive net present value is successfully funded, (Stein 2003). Additionally, by lowering the investment level, a CEO with a greater degree of managerial optimism might raise the investment efficiency of an underinvested company, hence increasing the firm's value. However, there is not enough data to demonstrate that a firm with a less optimistic CEO can successfully increase its investment efficiency by decreasing overinvestment and enhancing value when companies plan to overinvest, (Chen and Lin 2013). The efficiency of investments can be affected in the real world when management expropriates resources, chooses a subpar project, or restricts companies' ability to finance a potential project because microfinance and the information available to institutional investors are different, (Stein 2003).

It is possible that the management perspective will influence the value of the business if an investment that is skewed reduces the efficiency of the company's investment, (Chen & Lin 2013). Therefore, board composition and governance procedures may adversely influence financial performance in a number of techniques and theoretically result in corporate downfall, (Majeed et al. 2020). The agency issues relating to top management and shareholders may be handled by this arrangement (Hermalin & Michael 1991).

It is probable that a change in management will guide to an advancement in the financial performance of companies, and measures taken by the board that are well-reasoned will also have an effect on the governance of the organization. Therefore, the board structure of the corporation may influence the financial success of firm (Majeed et al. 2020; Khan et al. 2020). Reducing the asymmetric knowledge gap among shareholders and improving a company's image are two benefits of having a robust board of directors (Lokuwaduge & Heenetigala, 2017). Variables like board independence affect stock prices, and in large economies, laws are in place to increase the independence and qualifications of board members, (Yermack 2006). The removal of monopolies and the establishment of a competitive environment in the Pakistani economy are contentious topics. The reason for doing the current study is because in developing countries like Pakistan and rising markets that has its own economic status, structure of ownership, judicial system, culture, policies of government, and most importantly, system of corporate governance, and is subject to economic authorizations, the norms there, particularly with regard to corporate governance issues, can differ from those in other nations and have varying influence on firm value and financial performance. Arianpoor (2019). The interests of shareholders may be safeguarded throughout the corporate decision-making process by a number of corporate governance methods, including ownership structures and the makeup of the board of directors, Ashfaq and Rui (2019). Because institutional ownership is beneficial, cost-effective, and varied, it may also help with agency issues (Habib et al. 2015). Considering earlier research, there is a discrepancy between the moderating consequence of board independence between investment efficiency and firm value. This disparity provides a chance to investigate those factors in further detail. The results of this analysis may demonstrate the significance and need of this research, which can fill a research gap in this area, as the influence of investment efficiency on company value with a focus on the function of board independence has not been examined. This research may assist stakeholders in financial analysis and determine the investment behavior of firms in the Pakistani economic environment, given the significance of a corporation's financial performance and investment efficiency in the growth of the Pakistani economy. Furthermore, a real move to boost the nation's economy may be made by granting officials access to the economic sector.

The literature review as well as hypothesis development are described first in the parts that follow. The third part provides a description of the research technique. The fourth part then presents the study results. Lastly, the conclusion and discussion are given.



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Development of Hypotheses and Literature Review

Economic development is one of the primary objectives of national economic policies and choices, also sustainable economic development and growth are significantly impacted by effective investment (Hall & Lerner 2010). Conversely, to attain sustainable development and optimum economic growth, competitiveness is a key consideration. One of the characteristics of a successful business is competitive strength. According to Nugroho and Stoffers (2020), market rivalry has a significant influence on agency costs, company value, and financial performance. It may also enhance investment and business competence. The distinction between corporate ownership and corporate management is the source of the agency issue, which stands in the way of accomplishing the objective. Agreeing with Suhadak et al. 2019, the majority of large companies are managed by professional business executives who are under the impression that they have the authority to make decisions without keeping the interests of shareholders in mind.

Given the significant informational role that the competitive environment plays, a robust competitive environment fosters an efficient corporate governance culture and enhances management's control of investment and efficiency choices. Increased management effectiveness, openness, and accountability may result from this, which minimizes the possibility of managing inadequate investment choices (Paniagua et al., 2018). Executives and managers are advised to fulfil their responsibilities in order to preserve the sustainability of the firm when there is competition, Alimov (2014). Corporations with more market power assign money more efficiently as stock price information improves, which raises the company's financial performance and investment efficiency, Peress (2010). Thus, Hypothesis 1 is put out as follows in accordance with the theoretical underpinnings that have been presented:

Hypothesis 1 (H1). The firm value is influenced by the investments efficiency.

Independent directors are another essential corporate governance tool that may enhance or worsen the performance of the company. One of the main topics of discussion in corporate governance is independent directors, who have the ability to restrain top management and lessen agency issues, especially the issue of knowledge asymmetry. Monks and Minow (2004) demonstrated that, from the standpoint of agency theory, independent directors are more probable to shield stakeholders from management self-serving behavior and have a significant impact on the success of the company. Belkhir (2009) demonstrated how an oversight position might help independent directors lower the danger of moral hazards. According to De Andres et al. (2005), these directors should resolve disputes between majority and minority shareholders and enhance managers' performance by observing their work. This would eventually result in improved corporate performance.

The influence that independent directors have on organization performance, however, has been the subject of conflicting research in developing economies (Black et al. 2012; Ramdani & Witteloostuijn 2010; Marashdeh 2014; Mahadeo et al. 2012). The data supports the influence of independent directors on business success, despite the fact that several research studies have produced contradictory findings about the link between firm performance and board independence (Abdullah 2004). Due to their increased independence and willingness to safeguard their image in the outside market, independent executives are more inclined to execute their monitoring tasks and refrain from conspiring with CEOs (Fama 1980; Fama & Jensen 1983). Additionally, when there is pressure on the capital market to increase stock prices and investment value, managers often make short-term judgments and refrain from purchasing stocks because of the knowledge asymmetry among investors and managers. The independence of the board greatly raises the risk to the firms, which may also impact firm value, as the management tries to utilize the investment to manipulate the financial statements that are shown to the stock market in order to raise the stock price, (Nyman 2005). Given the discussion above, the third hypothesis is expressed as follows:

H3: The influence of firm value and investment efficiency is moderated by board independence.

Methodology

When choosing a research design, the study's objectives must be taken into account. The descriptive research design and quantitative research type were used for this investigation. In this research, we looked at non-financial firms that were listed between 2013 and 2022 on the Pakistan Stock Exchange.

The dependent Variable

Value: A popular metric for assessing a company's worth is Tobin's Q. This market-based metric is regarded as a primary dependent variable. It may capture the company's worth and is forward-looking. The ratio of total assets to market value of equity plus book value of equity is identified as Tobin's Q. According to Banos-Caballero et al. (2014), this metric outperforms more ratios of accounting and is less impacted by accounting procedures. According to the company's capital market value, it also takes firm risk into account (Smirlock et al. 1984). However, if businesses have access to debt finance, underinvestment may exaggerate the usage of this metric (Kose & Litov 2010; Dybvig & Warachka 2015). This metric is a useful comparison tool since it considers the market worth of businesses (Abdi et al., 2020; Jamal et al., 2024; Xie et al., 2019).



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Independent Variable

INV_{it} is the investment efficiency. Agreeing with Houcine (2017) and Biddle et al. (2009), the researchers calculated investment efficiency using Equation (1). Investment efficiency is a corporation conducting a project without market frictions that has a positive net present value.

Investment inefficiency is shown by mutually extreme and insufficient investment. Under-investment denotes the act of ignoring investment opportunities that have a positive net present value, whereas overinvestment refers to the act of investing in projects that have a negative value (Houcine 2017).

$$INV_{it+1} = \beta_0 + \beta_1 \text{ sales}_{i,t} + \varepsilon_{i,t+1} \quad (1)$$

INV_{it+1} is the total investment. It is represented as the difference relating to firm I's capital spending and asset sales at year t, scaled by the company's initial capital stock. $\text{Sales}_{i,t}$ represents the shift in sales for company I from previous year($t - 1$) to year t, scaled by previous sales.

For company I at year ($t + 1$), the residuals generated from Equation (1) to represent investment inefficiency are denoted by $\varepsilon_{i,t+1}$. The model is used since, in a perfect market, the marginal Q ratio should only reflect business investment, as per the neoclassical paradigm (Hayashi 1982; Houcine 2017, Jamal et al.,2025). However, sales growth serves as a stand-in for investment possibilities since it is difficult to construct the Q ratio (Biddle et al. 2009). The sales growth, in contrast to the Q ratio, lacks a theoretical foundation as a stand-in for investment prospects. However, it is supported by the subsequent intuition: a rise in sales predicts a rise in demand for a company's goods in the future (Morck et al. 1990), and expanding production facilities may be required to meet the rising demand, which requires investment (Houcine 2013). The value of residuals in Equation (1) are used as a firm-specific proxy for investment inefficiency since they show how the company's actual investment level differs from its planned investment. The value of this deviation indicates another indicator of investment effectiveness. Overinvesting is specified by positive residuals or a positive divergence from projected investment, whereas underinvesting is indicated by negative residuals. A negative multiplication of this error component's absolute value yields the investment efficiency metric. Accordingly, investment efficiency increases with the quantity (Richardson 2006).

Modifier Variables

$BI_{i,t}$: The proportion of unaffiliated, independent boards in relation to all board members refers as board independence, (Bhagat & Bolton 2019).

Control Variables

$SIZE_{it}$: The natural logarithm of total assets is applied to determine the size of the company. Firm size has been employed in a number of earlier research studies (Cassar & Holmes, 2003; Jamal et al., 2021; Al-Matari et al., 2012). The size of the corporation is probably going to have a favorable influence on corporate performance. The log of total assets is used to compute the size variable. Heteroscedasticity issues are lessened by the logarithm (Aliani & Zarai 2012).

LEV_{it} , The ratio of total debt to total assets is used to evaluate leverage. Leverage and business performance have a complex connection. Lenders' oversight may have a beneficial consequence on business performance (Saidat et al. 2019). Financial risk is represented by leverage (Shahwan 2015).

ROA_{it} : The net profit divided by the total assets is identified as return on assets. It is believed that businesses with greater ROA would execute better and take fewer risks (Aktas & Unal 2015; Jamal et al.,2022; Jamal et al., 2024).

Low financial liquidity is indicated by high profitability ratios. Conversely, the liquidity ratios are large (Zimon & Zimon 2019; Banos-Caballero et al. 2014). End Year is the name of the financial year-end control variable. If the company's fiscal year finishes in March, it is 1, and if not, it is 0.

Model

Hypothesis 1 was examined using Equation (2), while Hypothesis 2 was assessed using Equation (2).

$$\text{Value}_{it} = \beta_0 + \beta_1 INV_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \text{End Year} + \text{Year} + \text{Industry} + \varepsilon_{it} \quad (2)$$

$$\text{Value}_{it} = \beta_0 + \beta_1 INV_{it} + \beta_2 BI_{it} + \beta_3 BI_{it} \times INV_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \text{End Year} + \text{Year} + \text{Industry} + \varepsilon_{it} \quad (3)$$

Analytical Findings

Descriptive Summary

Table 1 displays descriptive data for the primary variables utilized in this analysis. A score over 1 indicates that the company is adding value, whereas a score below 1 indicates that the company's wealth is ending, according to Tobin's Q. This mean value of variable Value (Tobin's Q) used for firm value is 2.574, indicating that the businesses generate value.



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Table 1. Descriptive Summary

Variable	Observation	Mean	SD	Minimum	Maximum
Value	630	2.574	2.310	0.515	20.758
INV	630	−0.036	0.689	−0.618	7.974
SIZE	630	28.231	1.558	24.133	34.579
LEV	630	0.554	0.216	0.013	1.567
ROA	630	0.134	0.153	−0.404	0.830
BI	630	0.602	0.271	0.000	0.989

Correlation Matrix

The correlation analysis of the research variables is displayed in Table 2. At the 99% confidence level, the outcomes reveal a positive association between investment efficiency and company value (coefficient: 0.004).

Table 2. Correlation Analysis

Variable	1	2	3	4	5	6
Value	1					
INV	0.004***	1				
SIZE	0.215**	0.325**	1			
LEV	−0.283**	0.023	0.032	1		
ROA	0.132**	0.044*	0.223**	−0.087***	1	
BI	0.126**	−0.021	0.133**	0.217**	0.164**	1

Statistical significance is indicated by the symbols ***, **, and *** at the 10%, 5%, and 1% levels, respectively.

GLS Analysis

Based on Equation (2), Table 3 demonstrates that the investment efficiency has a significant and positive impact on the firm value ($\text{sig} < 0.01$ and coefficient = 0.298). Hypothesis 1 is therefore validated. The control variables mentioned in Equation (2), leverage has a negative consequence on firm value ($\text{sig} < 0.01$ with coefficient -0.342), whereas company size has a positive consequence ($\text{sig} < 0.01$ with coefficient 0.267).

The moderating effect of board ownership was examined using a modified multiple regression technique. The link between investment efficiency and company value is moderated by board independence, as seen by Equation (3) in Table 3 ($\text{sig} < 0.05$ with Coefficient is 0.124). Consequently, Hypothesis 2 is likewise validated. Equation (3) indicates that although company size of firm has an optimistic impact on firm value ($\text{sig} < 0.01$ with coefficient 0.472), leverage has a negative impact ($\text{sig} < 0.01$ with coefficient −0.178).

Table 3. Analysis Results of GLS

Variable	Equation 2	Equation 3
INV _{i,t}	0.278*** (4.230)	0.43*** (3.860)
BI _{i,t}		0.321 (0.840)
BI _{i,t} × INV _{i,t}		0.124** (2.210)
SIZE _{i,t}	0.287*** (6.760)	0.472*** (4.326)
LEV _{i,t}	−0.342*** (−3.123)	−0.178*** (−3.960)
ROA _{i,t}	0.235 (1.140)	0.066 (0.135)
Cons	2.361*** (5.230)	2.340*** (5.180)
Fixed Effect of END YEAR	Yes	Yes
Fixed Effect of YEAR	Yes	Yes
Fixed Effect of INDUSTRY	Yes	Yes
N	630	630
χ ² statistic	489.27 (0.000)	460.62 (0.000)
R ²	0.564	0.551
Adjusted R ²	0.568	0.578
Durbin-Watson statistics	1.886	1.861

At the 5% and 1% levels, respectively, statistical significance is indicated by the symbols ** and ***.

Observation about Equations (2) and (3): The conclusions of the Levin–Lin–Chu unit-root test indicate that every variable is stationary. The panel data hypothesis was accepted at the 95% confidence level, according to the F-Limer (Chow) findings. Thus, the Hausman test was employed to choose either fixed-effects or random models. The



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Hausman test's findings indicate that the fixed effects approach is the best choice for evaluating hypotheses. There is no significant autocorrelation of the error term according to the Durbin-Watson statistics. Variance heterogeneity did not exist, according to the investigations. The study model had autocorrelation, according to the Wooldridge test findings. To address the issues and variance of the heterogeneity problem, the model's coefficients were estimated using the GLS test.

Additional Analysis

The research findings of evaluating the hypotheses constructed on the robust regression are shown in Table 4. Robust regression indicates that the company value is positively and significantly associated by investment efficiency, with a size of 0.420 (sig < 0.01). Furthermore, company size of firm has a positive consequence on firm value (sig < 0.01 with coefficient is 0.464), whereas leverage has a negative impact (sig < 0.01 with coefficient is -0.180). Equation (3) indicates that the connection among investment efficiency and company value is moderated by board independence. Board independence has a 0.165 (sig < 0.01) impact on the connection relating investment efficiency and business value. As a consequence, the outcomes of this test and GLS are in agreement.

Table 4. Robust Regression Analysis

Variable	Equation 2	Equation 3
INV _{i,t}	0.420 *** (4.740)	0.267 *** (3.630)
BI _{i,t}		0.096 (0.250)
BI _{i,t} ×INV _{i,t}		0.165 *** (4.220)
SIZE _{i,t}	0.464 *** (4.040)	0.754 *** (5.970)
LEV _{i,t}	-0.180 *** (-3.240)	-0.231 *** (-4.140)
ROA _{i,t}	0.124 (1.130)	0.082 (1.230)
Cons	4.084 *** (5.162)	3.572 *** (8.140)
Fixed Effect of END YEAR	Yes	Yes
Fixed-Effect of YEAR	Yes	Yes
Fixed-Effect INDUSTRY	Yes	Yes
N (Observations)	630	630
χ ² statistic	185.65 (0.000)	210.67 (0.000)
R ²	0.528	0.533
Adjusted R ²	0.478	0.539
Durbin-Watson statistic	1.784	1.824

At the 5% and 1% levels, respectively, statistical significance is indicated by the symbols ** and ***.

Discussion

According to this research, the business value is positively and significantly impacted by investment efficiency. The value of the corporation is reflected in the price of its shares. The worth of the firm increases with the stock price (Husnan 2012). Improvements in stock price information lead to more effective capital allocation, which raises the corporation's investment efficiency, firm performance as well as firm value (Peress 2010). This outcome is likewise predicted by the hypothesis. Theoretical and empirical literature specifies that a company's value is significantly influenced by its ownership structure (Mnasri & Ellouze 2015). Previous research has also produced conflicting findings, and the board independence and its investment efficiency in monitoring and disciplining managers probably varies by nation (Lemma et al. 2018). But according to this research, board ownership, in more firm-specific investments, boosts investment efficiency by generating higher long-term productivity. Research indicates that institutional investors possess the resources, opportunities, and capacity to oversee business management and enforce discipline (Chung et al. 2002). These large-share investors may directly suffer the agency costs of ownership and control separation because they can take advantage of economies of scale in information collecting (Koh 2003). The incremental advantages of the additional expenses of monitoring are probably going to be outweighed by more monitoring (Jensen & Meckling 1976; Ramsay & Blair 1993; Shleifer & Vishny 1986). Additionally, substantial institutional investors are more motivated to keep an eye out for managerial myopia. and lower information asymmetries among stakeholders external to management (Lev 1988).

Bushee (1998) supported this claim by pointing out that when investors from institutions have very high levels of ownership in a company, Limited investing conduct is encouraged by their rapid turnover and momentum trading. Further, institutional ownership lessens the pressure on managers to retain in myopic investment behaviour. Management may be forced to increase productivity and efficiency by large shareholders (Shleifer & Vishny 1986; Vintila & Gherghina 2014). Institutional shareholders can monitor the company's executive management, which boosts efficiency, because they are able to inform shareholders and monitor the organization's performance (Rashed et al. 2018). This claim that management is monitored effectively and performance of institutional investors is improved was backed by Elyasiani et al. (2010).



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However, nonexecutive managers now trust the knowledge and expertise of internal managers since they are more efficient and driven than external managers (Riyadh et al. 2019). They have thus appointed qualified internal managers (Riyadh et al. 2019) as a result of nonexecutive managers' emphasis on financial matters and corporate management operations (Uyar et al. 2020). Generally speaking, the findings of this investigation are anticipated by the idea of agency theory proposed by Jensen and Meckling in 1976, which asserts that Owner oversight need to be used as a means of verifying managerial behaviour that benefits them in order to expand efficiency, which can ultimately enhance firm value and financial performance. This theory is established on the idea that owner supervision should be implemented through the institutional ownership, independent board and public ownership.

Conclusions

This research showed how investment efficiency impacts business value while highlighting the significance of board independence. Because of its diverse corporate governance and ownership structure, as well as its distinct economic circumstances and environment as a developing nation, Pakistan may experience different outcomes from other nations when it comes to the impression of executive structure and ownership on firm value. Ownership and executive structures that comply with Pakistani regulations will therefore apparently be necessary. Information from non-financial firms from 2010 to 2019 was analyzed for this purpose, and the most significant market-based performance metric was utilized to gauge company value.

Agreeing to the research results, business value is impacted by investment efficiency. Board independence also mitigates this effect. Evidence from empirical research of the influence of board independence on business value is presented in this paper. The results have significant ramifications for scholars, decision-makers, and business boards, suggesting that they should concentrate on board independence to increase significant value. Managers must properly monitor their behaviour and answer to shareholders in order to accomplish strategic objectives and boost business value. Due to the cooperation between the management and the board of directors, institutional shareholders may lead to opportunistic behaviour (Suhadak et al. 2019). In this study, agency theory provides theoretical foundations. The findings of this research may be used by practitioners to improve business value and create corporate financial strategy. The findings imply that investors should take investment efficiency into account when determining the firm's worth. In order to boost company value, businesses may also reduce information asymmetry.

Future Research

To get more definitive findings, it is advised that future studies take into account macroeconomic dynamics and risk variables. Advanced research in this area would be extremely desired. It is advised that more research be done to assess businesses with varying degrees of institutional ownership. and to make observations across a range of industries.

As per Black and Scholes (1974), investors can be divided into three groups: those who like stocks with extreme dividend yields, those who favour capital gains and dividend returns, and those who choose stocks with low dividend yields. As a result, investor behaviour is crucial to investing. Therefore, it is recommended that future research take psychological traits and financial psychology into account.

This study adds to the body of existing literature about the Pakistani environment, clarifies the findings, enhances the existing literature, and helps scholars make strategic judgements.

Limitation

Because of the time and geographical constraints of this research, care should be exercised when extrapolating the findings to other statistical populations and other periods. The findings of this research, which focuses on Pakistani businesses, are indicative of the country's business climate and economy. Additionally, the findings are restricted to the factors that were chosen. Firm value and financial performance are influenced by several internal and external variables. Investor behavior is impacted by interest rate variations caused by market anomalies as well (Natarajan et al., 2020). Thus, the worth of the company is similarly impacted. Additionally, we selected the crucial performance based on accounting indicator in this study since previous studies have suggested diverse ways to calculate the business value. Other methods of determining business value, however, may have different outcomes.

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