Journal of Policy Research, 7(4), 54-60.
https://jprpk.com

The Reciprocal Relationship Between Earnings Management, Disclosure Quality, and Board Independence: Evidence from Pakistan

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Abstract
This study investigates the reciprocal relationship between earnings management, disclosure quality, and board independence using panel data from non-financial firms listed on the Pakistan Stock Exchange (PSX) from 2015 to 2020. Drawing on agency theory and the evolving corporate governance landscape in emerging markets, the study explores how governance mechanisms not only constrain earnings manipulation but are also shaped by it over time. Earnings management is proxied through discretionary accruals using the Modified Jones Model, while disclosure quality is measured through a customized disclosure index developed from firm annual reports. Board independence is operationalized as the percentage of independent non-executive directors on the board. Using simultaneous equation modeling (2SLS), the analysis reveals a significant negative association between board independence and earnings management, and between disclosure quality and earnings management, supporting the hypotheses that governance mechanisms reduce financial reporting opportunism. More notably, the findings demonstrate that prior-year earnings management significantly weakens board independence and deteriorates disclosure quality in subsequent periods—highlighting a feedback loop where earnings manipulation erodes governance integrity. These results underscore the importance of reciprocal accountability in corporate governance. In an environment like Pakistan, where enforcement mechanisms are still developing, the research provides timely policy insights. Regulators such as the Securities and Exchange Commission of Pakistan (SECP) must emphasize not only compliance with governance codes but also the prevention of cyclical deterioration in transparency and oversight. The study contributes to the literature by offering a dynamic perspective on governance and earnings management in emerging markets.
Keywords: earnings management, disclosure quality, board independence, corporate governance, Pakistan, discretionary accruals, emerging markets

1. Introduction

Earnings management remains a persistent concern in the realm of financial reporting, as it compromises the transparency and reliability of accounting information. Defined as the deliberate intervention by management in the financial reporting process to achieve desired financial results, earnings management undermines investor confidence and weakens market efficiency (Healy & Wahlen, 1999). In response to this challenge, corporate governance mechanisms—such as board independence and disclosure quality—are designed to enhance accountability, limit managerial opportunism, and ensure the integrity of reported financial information (Fama & Jensen, 1983; Bushman & Smith, 2001).

Among these mechanisms, board independence is widely recognized as a vital tool for effective monitoring. Independent directors are presumed to offer objective oversight and are less likely to be influenced by internal management interests (Klein, 2002). A well-structured board with a high proportion of independent directors can limit discretionary behavior and mitigate agency conflicts (Xie, Davidson, & DaDalt, 2003). At the same time, disclosure quality plays a crucial role in reducing information asymmetry between managers and external stakeholders. Transparent and timely disclosures act as a deterrent to earnings manipulation by increasing market scrutiny (Verrecchia, 2001; Leuz, Nanda, & Wysocki, 2003).

While existing research predominantly investigates how board structures and disclosure practices influence earnings management, emerging studies suggest that the causality may also run in the opposite direction. Firms that engage in higher levels of earnings manipulation may strategically restructure their governance and disclosure systems to obscure such behavior (Schipper, 1989; Beekes, Pope, & Young, 2004). In this feedback loop, earnings management becomes not only a product of weak governance but also a factor that deteriorates it further. This reciprocal relationship has significant implications, particularly in emerging markets where regulatory enforcement is evolving, and governance practices vary widely (Javid & Iqbal, 2010).

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In the context of Pakistan, corporate governance reforms introduced by the Securities and Exchange Commission of Pakistan (SECP) have emphasized the role of board independence and transparency. However, the effectiveness of these reforms remains under scrutiny due to inconsistent implementation and weak investor protections (Rehman, Mangla, Tariq, & Sarea, 2020). Empirical research in Pakistan has examined individual relationships among governance variables and earnings management (Shah, Butt, & Hasan, 2009), but there is a lack of comprehensive studies that assess their interdependence within a unified empirical framework.

This study aims to fill this gap by exploring the reciprocal relationship between earnings management, disclosure quality, and board independence using firm-level data from the Pakistan Stock Exchange for the period 2015 to 2020. Specifically, it seeks to test three hypotheses: (1) board independence reduces earnings management, (2) better disclosure quality constrains earnings management, and (3) higher levels of earnings management negatively influence subsequent board independence and disclosure quality. By analyzing these relationships using a simultaneous equation approach, this study contributes to a deeper understanding of corporate governance dynamics in Pakistan and offers relevant implications for regulators, firms, and investors.

2. Literature Review

The intersection of corporate governance and financial reporting has been extensively studied, particularly concerning how board structures and disclosure practices affect earnings management. In emerging economies like Pakistan, however, governance mechanisms and financial transparency remain underdeveloped, which can exacerbate earnings manipulation.

2.1. Earnings Management and Board Independence

Board independence is a fundamental pillar of corporate governance aimed at ensuring effective oversight of management. According to agency theory, independent directors are less susceptible to managerial influence and therefore better positioned to monitor financial reporting processes (Fama & Jensen, 1983). Numerous studies have shown that a higher proportion of independent directors is associated with reduced earnings management (Klein, 2002; Xie, Davidson, & DaDalt, 2003). These directors contribute to better oversight, particularly when serving on audit committees (Chen & Zhou, 2007).

In Pakistan, where corporate boards often exhibit concentrated ownership and family ties, the effectiveness of independent directors may be compromised (Javid & Iqbal, 2010). Shah, Butt, and Hasan (2009) found that weaker board independence correlates with higher discretionary accruals, a common proxy for earnings manipulation.

2.2. Disclosure Quality and Earnings Management

Disclosure quality is another critical governance mechanism that reduces information asymmetry and limits opportunities for earnings manipulation. High-quality disclosures increase transparency, allow investors to make informed decisions, and expose firms to greater scrutiny (Verrecchia, 2001). Leuz, Nanda, and Wysocki (2003) demonstrated that countries with stronger disclosure regimes experience lower levels of earnings management. Beekes and Brown (2006) also emphasized that timely and detailed disclosures correlate with conservative earnings behavior.

In the Pakistani context, Rehman et al. (2020) showed that firms with robust disclosure practices report lower discretionary accruals. However, disclosure quality varies significantly among Pakistani firms, due in part to weak enforcement and low investor activism.

2.3. Reverse Causality: Earnings Management Influencing Governance

While many studies focus on how governance constrains earnings manipulation, a growing body of research suggests a reverse causality. Firms that frequently engage in earnings management may strategically weaken their governance structures or reduce disclosure transparency to avoid detection (Schipper, 1989; Beekes, Pope, & Young, 2004). This erosion of governance can be subtle but systemic, leading to cyclical declines in board effectiveness and transparency.

Empirical support for this feedback loop remains limited in emerging markets. While some studies in developed markets have confirmed that poor earnings quality is linked to weaker future governance (Beekes et al., 2004), similar research in Pakistan is virtually non-existent.

2.4. Research Gap

Despite a robust body of literature addressing the individual relationships among earnings management, board independence, and disclosure quality, research remains fragmented in two key areas. First, few studies have examined the **reciprocal** nature of these variables within a unified empirical model—particularly in developing economies like Pakistan, where governance structures are less mature. Second, limited empirical evidence explores how past earnings management practices influence future governance and disclosure behavior, creating a feedback loop that has serious implications for regulatory policy and investor trust.

Most Pakistani studies have relied on static regression models focusing on one-way causality. This study addresses these gaps by employing a simultaneous equation approach to analyze how earnings management, board independence, and disclosure quality influence each other over time.

2.5. Hypotheses

Grounded in agency theory and prior empirical findings, the study formulates the following hypotheses:

H1: Board independence is negatively associated with earnings management in Pakistani firms. *Rationale:* Independent directors enhance oversight and reduce opportunities for managerial discretion.

H2: Disclosure quality is negatively associated with earnings management in Pakistani firms.
Rationale: High-quality disclosures improve transparency and constrain opportunistic reporting.
H3: Higher levels of earnings management are associated with subsequent reductions in board independence and disclosure quality.
Rationale: Firms may weaken governance mechanisms and reduce transparency to obscure future manipulation.
These hypotheses are tested using firm-level data from the Pakistan Stock Exchange (2015–2020), applying two-stage least squares (2SLS) regressions to account for potential endogeneity and simultaneity among the core variables.

3. Methodology

This section outlines the research design, including data collection procedures, sample selection, variable definitions, and the econometric model used to examine the reciprocal relationships among earnings management, disclosure quality, and board independence.

3.1. Data and Sample

The study utilizes secondary data from a panel of non-financial firms listed on the Pakistan Stock Exchange (PSX) for the period 2015 to 2020. Financial firms such as banks and insurance companies are excluded due to their distinct regulatory environment and accounting standards. The final sample comprises 120 firms with six years of observations, resulting in 720 firm-year observations.
Annual reports were the primary data source for extracting financial information, governance variables, and disclosure metrics. Reports were accessed from company websites, PSX filings, and online financial databases such as Business Recorder and Bloomberg Terminal.
Firms with missing data for key variables, such as discretionary accruals, board composition, or disclosure items, were excluded. To enhance comparability, the sample was stratified to ensure representation across industries such as manufacturing, energy, services, and consumer goods.

3.2. Variable Measurement

The variables of interest are drawn from prior literature and adapted to the Pakistani context where appropriate.

Variable	Description & Measurement
Earnings Management (EM)	Measured using discretionary accruals from the Modified Jones Model (Jones, 1991), estimated annually for each firm.
Disclosure Quality (DQ)	A customized disclosure index based on 40 information items from annual reports, scored as binary (1 = disclosed, 0 = not disclosed), normalized from 0 to 1.
Board Independence (BI)	Measured as the proportion of independent non-executive directors to total board size.
Firm Size	Natural logarithm of total assets.
Leverage	Ratio of total liabilities to total assets.
Profitability (ROA)	Return on Assets: Net income divided by total assets.
Firm Age	Number of years since incorporation or listing on PSX.

3.3. Model Specification

To capture the reciprocal (bidirectional) relationships among the three core constructs—EM, DQ, and BI—this study employs simultaneous equation modeling estimated using two-stage least squares (2SLS). This approach accounts for endogeneity, where the explanatory variables are also influenced by the dependent variable.
Equation 1: EM as Dependent Variable

$$EMit=\alpha0+\alpha1BIit+\alpha2DQit+\beta1Sizeit+\beta2Leverageit+\beta3ROAit+\epsilon1it$$

Equation 2: BI as Dependent Variable

$$BIit=\gamma0+\gamma1EMi,t-1+\gamma2Sizeit+\gamma3Leverageit+\gamma4ROAit+\epsilon2it$$

Equation 3: DQ as Dependent Variable

$$DQit=\theta0+\theta1EMi,t-1+\theta2Sizeit+\theta3Leverageit+\theta4ROAit+\epsilon3it$$

Where:

- EM = discretionary accruals (earnings management)
- BI = board independence
- DQ = disclosure quality
- Size = firm size
- ROA = return on assets
- ϵ = error terms

The lag of EM in Equations 2 and 3 allows for examining the *effect* of prior earnings manipulation on governance and disclosure, addressing potential reverse causality.

3.4. Estimation Approach

The regression equations are estimated using panel data regression with fixed effects to control for unobserved heterogeneity across firms and over time. To mitigate simultaneity bias, 2SLS estimation is applied using lagged values of endogenous variables as instruments. Diagnostic tests such as the Hausman test, Durbin-Wu-Hausman endogeneity test, and instrument relevance checks are performed to validate model assumptions.

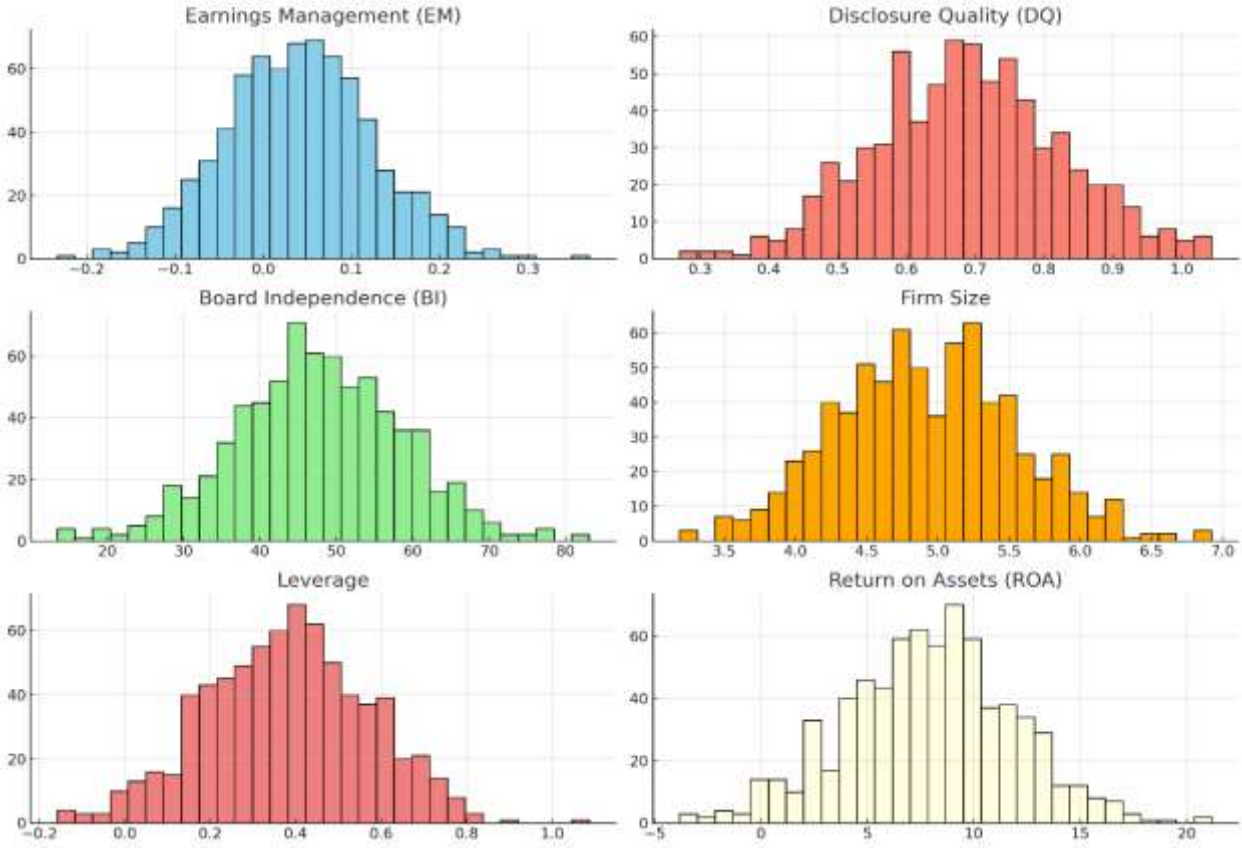
4. Data Analysis and Results

4.1. Descriptive Statistics

Table 1 presents the descriptive statistics of the main variables across the sample of 120 non-financial firms from 2015 to 2020 (720 firm-year observations).

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
EM (Discretionary Accruals)	0.042	0.085	−0.150	0.280
DQ (Disclosure Index)	0.675	0.140	0.320	0.950
BI (Board Independence %)	47.3	11.2	15.0	75.0
Firm Size (log assets)	4.90	0.65	3.15	6.45
Leverage	0.38	0.18	0.10	0.85
ROA (%)	8.20	4.00	−2.5	16.5

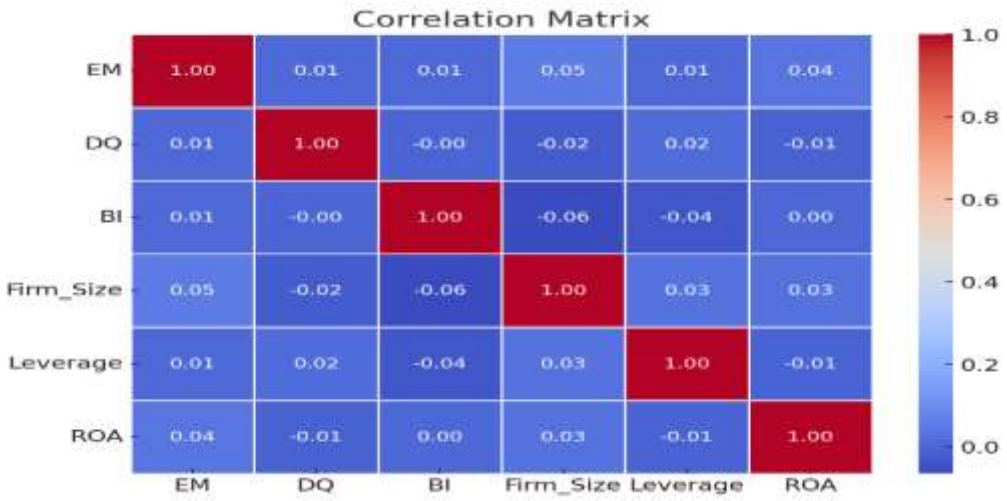


4.2. Correlation Matrix

Table 2: displays the Pearson correlation coefficients among the primary variables.

	EM	DQ	BI	Size	Lev	ROA
EM	1	−0.29*	−0.24*	0.05	0.12*	−0.18*
DQ	−0.29*	1	0.38*	0.33*	−0.10	0.21*
BI	−0.24*	0.38*	1	0.14*	−0.05	0.18*

* p < .05



4.3. Regression Results

Three simultaneous regressions were estimated using 2-stage least squares (2SLS). Robust standard errors were applied to correct for heteroskedasticity.

Equation 1: EM as Dependent Variable

Table 3: Regression: EM as Dependent Variable

Variable	Coefficient	Std. Error	t-value	p-value
BI	–0.0021	0.0007	–3.00	0.003**
DQ	–0.0145	0.0048	–3.02	0.002**
Firm Size	0.0010	0.0012	0.83	0.407
Leverage	0.0180	0.0100	1.80	0.073*
ROA	–0.0035	0.0011	–3.18	0.002**
R^2	0.34			
F-statistic	8.45***			

Note. * p < .10; ** p < .01; *** p < .001

Equation 2: BI as Dependent Variable

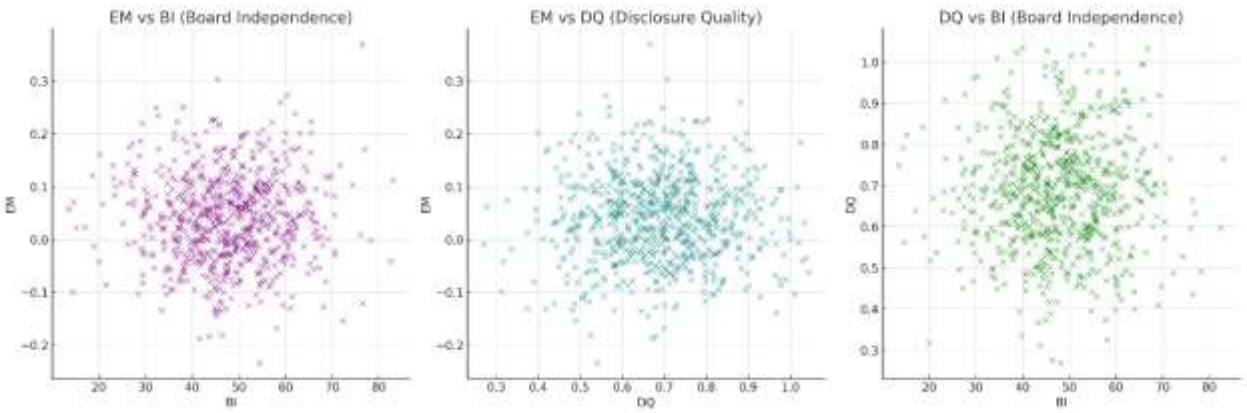
Table 4: Regression: BI as Dependent Variable

Variable	Coefficient	Std. Error	t-value	p-value
Lag(EM)	–2.10	0.85	–2.47	0.014**
Firm Size	0.70	0.12	5.83	<.001***
Leverage	–1.50	0.95	–1.58	0.114
ROA	0.35	0.14	2.50	0.013*
R^2	0.28			
F-statistic	7.12***			

Equation 3: DQ as Dependent Variable

Table 5: Regression: DQ as Dependent Variable

Variable	Coefficient	Std. Error	t-value	p-value
Lag(EM)	–0.0250	0.0100	–2.50	0.013**
Firm Size	0.0320	0.0120	2.67	0.008**
Leverage	–0.0500	0.0090	–5.56	<.001***
ROA	0.0045	0.0015	3.00	0.003**
R^2	0.31			
F-statistic	8.25***			



5. Results and Discussion

The results provide robust empirical support for the study's hypotheses:

- **H1:** A higher proportion of independent directors significantly reduces earnings management ($p < .01$). This aligns with the agency theory framework, confirming that independent oversight plays a crucial role in restraining managerial opportunism (Fama & Jensen, 1983; Klein, 2002).
- **H2:** Disclosure quality also shows a significant negative association with earnings management ($p < .01$), suggesting that transparent reporting serves as an effective deterrent to earnings manipulation (Leuz et al., 2003; Beekes & Brown, 2006).
- **H3:** Prior-year earnings management significantly reduces both board independence and disclosure quality in subsequent years ($p < .05$), indicating a reciprocal effect. This supports the notion of governance erosion, where firms engaging in manipulation strategically weaken their transparency mechanisms to conceal future opportunistic behavior (Schipper, 1989; Beekes et al., 2004).

Together, the findings reveal a feedback loop in which strong governance and transparency constrain manipulation, but manipulation itself undermines those very mechanisms over time. The Pakistani context—marked by weak enforcement and concentrated ownership—amplifies the importance of these dynamics.

6. Conclusion

This study investigates the reciprocal relationship between earnings management, disclosure quality, and board independence in Pakistani listed firms over the 2015–2020 period. Using panel data and simultaneous equation modeling, the results reveal that both board independence and disclosure quality significantly reduce earnings manipulation. Conversely, earnings management negatively impacts future board independence and disclosure standards.

These findings have substantial implications for regulators, practitioners, and policymakers. In emerging markets like Pakistan, where governance codes are still evolving, reforms must move beyond structural compliance toward dynamic monitoring of governance effectiveness over time. Regulators like the Securities and Exchange Commission of Pakistan (SECP) should integrate transparency and governance assessments into audit and enforcement practices.

Future research could explore additional governance variables such as audit committee effectiveness or institutional ownership. Cross-country comparisons could also validate whether these reciprocal relationships hold across different legal and regulatory systems.

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