IRJEMS International Research Journal of Economics and Management Studies
Published by Eternal Scientific Publications
ISSN: 2583 – 5238 / Volume 4 Issue 8 August 2025 / Pg. No: 205-210
Paper Id: IRJEMS-V4I8P121, Doi: 10.56472/25835238/IRJEMS-V4I8P121

Original Article

Supervisory Board Independent and Earning Management: Meta-Analysis

[1]Desi Ilona
[1]Accounting Department, Universitas Ekasakti, Padang, Indonesia.

Received Date: 13 July 2025 Revised Date: 30 July 2025 Accepted Date: 12 August 2025 Published Date: 23 August 2025

Abstract: *This meta-analysis examines the relationship between supervisory board independence and earnings management by synthesising empirical evidence from 30 studies. Using a random-effects model to account for heterogeneity, the analysis reveals a significant negative association (overall effect size = 0.29, $p < 0.001$), indicating that greater board independence correlates with reduced earnings manipulation. Subgroup analyses revealed a stronger effect in the manufacturing sector (0.33, $p < 0.001$) compared to the services sector (0.19, $p = 0.07$), suggesting industry-specific governance dynamics. The study addresses heterogeneity ($Q = 55.51$, $p < 0.001$; $I^2 = 72\%$) and confirms minimal publication bias through the symmetry of the funnel plot. Findings align with agency theory, emphasising the governance role of independent boards in enhancing the integrity of financial reporting. Practical implications underscore the need for sector-specific governance policies, while limitations suggest the importance of future research on contextual moderators. This research consolidates fragmented literature and provides policymakers with evidence-based insights to strengthen corporate oversight mechanisms.*

Keywords: *Supervisory Board Independence, Earnings Management, Meta-Analysis, Indonesia.*

I. INTRODUCTION

The relationship between supervisory board independence and earnings management is significant within the framework of corporate governance. Agency theory suggests that independent boards fulfil a vital monitoring role over management, which helps mitigate the potential for earnings management. Several studies have found that increased board independence often correlates with improved earnings quality and decreased earnings manipulation. For instance, [1] demonstrated that greater board independence is associated with a reduction in discretionary accruals, which are often employed in earnings management to distort financial results. This indicates that independent directors can have a stabilising influence on the financial reporting process by promoting adherence to higher standards of earnings integrity. Empirical evidence further supports the idea that independent boards enhance oversight, thereby curbing management's opportunistic behaviours. [2] showed that firms with a higher proportion of outside directors are less likely to engage in earnings management, as these directors are generally more effective in monitoring managerial actions and ensuring transparency in financial reporting. Additionally, [3] emphasised the role of board independence in reducing agency problems that could result in earnings misreporting, thus reinforcing the importance of independent oversight in enhancing financial accountability.

However, while there is considerable support for a connection between board independence and improved earnings quality, some studies present more nuanced findings. For example, [4] reported no significant relationship between board independence and the level of earnings management, implying that external factors or the specific context of the study might influence this relationship. This suggests that board independence is not a panacea for earnings management problems but rather interacts with other governance mechanisms and organisational factors, as also noted by [5], who found no significant association between board independence and financial reporting quality. Moreover, the effectiveness of an independent board may depend on contextual factors such as the frequency of board meetings and the composition of the audit committee. Research by [6] suggests that an increase in board meetings may be correlated with higher levels of earnings management, indicating that a higher frequency of meetings does not necessarily lead to better governance practices. Conversely, [7] suggested that a strong audit committee composed of independent members can significantly reduce abnormal accruals, further emphasising the need for a comprehensive approach to governance structures to mitigate earnings manipulation. In summary, while the relationship between supervisory board independence and earnings management is complex and influenced by multiple variables, the prevailing evidence suggests that increased board independence generally contributes positively to reducing earnings management practices. The intricate nature of this relationship underscores the need for ongoing empirical research to better understand its nuances and determine optimal governance structures that promote financial integrity in firms.

The relationship between supervisory board independence and earnings management has been extensively investigated, but significant gaps remain in the existing literature. This meta-analysis highlights several underexplored areas that warrant further examination. Firstly, while numerous studies document a negative correlation between board independence and earnings management [8], [9], [10], there is inconsistency in the conditions under which this relationship holds. For instance, the effect of board independence can be contingent on ownership structure and auditor quality, as evidenced by findings that underscore the complexity of these dynamics [11], [12]. Specifically, the influence of board independence diminishes in companies where executive ownership is substantial, indicating a need for research that delineates under what governance structures board independence optimally mitigates earnings management.

Furthermore, existing literature tends to overlook the role of external environmental factors and context-specific variables. For example, studies have identified the efficacy of independent boards in curbing operational earnings management practices, but these findings are predominantly drawn from contexts such as Jordan and the UK [13], [14], [15]. Consequently, further investigation into diverse regulatory and cultural contexts could yield insights into how local variations impact the effectiveness of board independence. Such explorations may include comparisons between developed and emerging markets, which could illuminate different governance challenges and responses [16], [17]. Additionally, there is a noticeable lack of standardised measures across studies, particularly in how earnings management is defined and quantified. Various methodologies have been employed, such as the modified Jones model [13] and discretionary accruals calculations [18], which complicates cross-study comparisons and meta-analytic robustness. Therefore, establishing a unified framework for measuring earnings management could be pivotal in coherently synthesising research outcomes.

Moreover, the empirical evidence analysing the interplay of board characteristics—beyond independence—remains sparse. Research to date has indicated that features such as board size, gender diversity, and meeting frequency also contribute significantly to board effectiveness in monitoring management decisions [19], [20]. Addressing this gap would provide a more nuanced understanding of how these interconnected dimensions of board function collectively influence earnings management practices. Lastly, while the meta-analytic approach to synthesising previous studies on audit committee effectiveness and earnings management has seen some traction [21], the role of supervisory boards remains underrepresented, particularly in non-Western contexts. Studies point to the importance of independent supervisory boards in reducing earnings management; however, similar investigations across various sectors and geographies are limited. Further research that aims to compare multiple supervisory board models across jurisdictions could enhance the generalizability and applicability of findings related to board independence. In conclusion, addressing these research gaps will not only improve the understanding of the nexus between supervisory board independence and earnings management but also facilitate the formulation of robust governance frameworks across various corporate settings.

II. METHODS

The meta-analysis on supervisory board independence and earnings management employed a systematic methodology to synthesise findings from 30 empirical studies. A comprehensive literature search was conducted using Google Scholar academic databases. It employs keywords related to board independence and earnings management, followed by strict inclusion criteria to ensure relevance and methodological rigour (2021-2025). Extracted data included effect sizes (t-statistics) and were then transformed into coefficient correlations, sample sizes, and study characteristics (sector). The transformation formula from t statistic to r (coefficient correlation) is as follows: $r = \sqrt{t^2/t^2\text{-df}}$. Based on the r, we calculate the z (effect size), variances (Vz), and Standard error (SEz) using this formula: $z = 0.5 \times \text{Ln}((1+r)/(1-r))$, $Vz=1/(n-3)$, and $SEz\sqrt{Vz}$. A random-effects model was adopted to account for heterogeneity across studies, with effect sizes pooled using inverse-variance weighting. Subgroup analyses compared results between sectors (e.g., manufacturing vs. services), while meta-regression explored potential moderators. Heterogeneity was assessed via *Q-statistics*, I^2, and *tau²*, with publication bias evaluated through funnel plots and Egger's test. This approach enabled the quantification of the overall relationship while accounting for variability in study designs and contexts.

III. RESULTS AND DISCUSSION

The final sample of the study consists of 1527 companies (thirty articles). The dataset summarizes various statistical measures across multiple variables, including sample size (N), t-statistic, correlation coefficient (r), effect size (Z), variance of Z (VZ), and standard error of Z (SEZ). On average, the sample size was 50.90, with a wide range from a minimum of 9 to a maximum of 156 and a standard deviation of 36.44, indicating considerable variability in sample sizes. The mean t-statistic was -0.78, marking a slight negative trend on average; however, individual values ranged from -11.35 (strongly negative) to 5.26 (moderately positive), with a standard deviation of 2.82, reflecting substantial dispersion. The mean correlation coefficient (r) was 0.26, indicating a weak-to-moderate positive relationship on average, with values spanning from 0.01 (negligible) to 0.85 (strong) and a standard deviation of 0.21. The effect size (Z) averaged 0.30 (small to medium), ranging from 0.01 to 1.27 (large), with a standard deviation of 0.28. The variance of Z (Vz) had a mean of 0.04, ranging from 0.01 to 0.17, with low variability (SD = 0.03). Lastly, the standard error of Z (SEz) averaged 0.18, with values between 0.08 and 0.41 and a relatively small standard deviation (0.07), indicating moderate consistency in measurement error. Overall, the data exhibit notable variability in sample sizes and effect sizes, with correlations and effect sizes generally falling within the small to moderate range.

Table 1. Descriptive statistics

	N (sample)	t statistic	r correlation	Z (size effect)	Vz (variance z)	SEz (standard error z)
Mean	50.90	-0.78	0.26	0.30	0.04	0.18
Minimal	9.00	-11.35	0.01	0.01	0.01	0.08
Maximal	156.00	5.26	0.85	1.27	0.17	0.41
Std. deviation	36.44	2.82	0.21	0.28	0.03	0.07

Note. N=1527

The Test of Homogeneity assesses whether the effect sizes across studies are consistent (homogeneous) or significantly varied. For the service (Jasa) sector, the Q-statistic (11.679, df = 7) was not statistically significant (p = .112), suggesting that the effect sizes are relatively homogeneous, with no strong evidence of substantial variation between studies. In contrast, the manufacturing sector showed significant heterogeneity, with a much larger Q-statistic (80.427, df = 21) and a highly significant p-value ($p < .001$), indicating substantial variability in effect sizes across studies. The overall analysis, combining both sectors, also revealed significant heterogeneity (Q = 95.606, df = 29, $p < .001$), reinforcing that the effect sizes differ more than would be expected by chance alone. These results imply that while service sector studies are relatively consistent, manufacturing sector studies exhibit notable differences, possibly due to moderating factors such as study design, sample characteristics, or contextual variations. A random-effects model may be more appropriate for manufacturing and the overall analysis to account for this heterogeneity.

Table 2. Homogeneity test

	Chi-square (Q statistic)	df	Sig.
Services	11.679	7	0.112
manufacture	80.427	21	0.000
Overall	95.606	29	0.000

The meta-analysis results reveal statistically significant positive effect sizes across both service (*Jasa*) and manufacturing sectors, as well as in the overall pooled estimate. The service sector shows a small-to-moderate effect size of 0.193 (p = 0.016), with a 95% confidence interval ranging from 0.036 to 0.351, indicating that the true effect is likely positive but relatively modest. In contrast, the manufacturing sector demonstrates a stronger effect size of 0.327 ($p < 0.001$), with a tighter confidence interval (0.198 to 0.455), suggesting a more robust and consistent positive effect. The overall combined effect size is 0.293 ($p < 0.001$), with a confidence interval of 0.189 to 0.397, reinforcing the general trend of a significant positive effect across all studies. The effect size of the manufacturing sector is notably larger than that of services, and both are statistically significant, as indicated by their Z-scores (2.403 for services, 4.981 for manufacturing, and 5.517 overall). These findings suggest that, while the effect is present in both sectors, it is more pronounced in the manufacturing sector. The relatively small standard errors (0.080 for services, 0.066 for manufacturing, and 0.053 overall) further support the precision of these estimates.

Table 3. Effect size estimate

Sector/ overall	Effect Size	Std. Error	Z	Sig. (2-tailed)	95% Confidence Interval	
					Lower	Upper
Service	0.193	0.080	2.403	0.016	0.036	0.351
Manufacture	0.327	0.066	4.981	0.000	0.198	0.455
Overall	0.293	0.053	5.517	0.000	0.189	0.397

A forest plot is a graphical representation that effectively summarises the results of a meta-analysis, allowing researchers to visualise the individual effects of studies along with an aggregated estimate of the effect. Typically, each study included in a meta-analysis is represented by a point estimate (often depicted as a square) and a corresponding confidence interval (CI) illustrated by horizontal lines extending from the point estimate. The overall effect size is typically represented as a diamond at the bottom of the plot, which encompasses the combined confidence interval for all studies [22], [23], [24]. The forest plot presents the results (see Figure 1) of a meta-analysis comparing effect sizes across multiple studies, categorised into subgroups (likely by sector, e.g., services and manufacturing). The overall effect size is 0.29 ($p < 0.001$), with a 95% confidence interval of 0.19 to 0.40, indicating a statistically significant small-to-moderate positive effect. The service (Jasa) subgroup shows a smaller but still significant effect (0.19, p = 0.07), while the manufacturing subgroup demonstrates a stronger effect (0.33, $p < 0.001$). Individual study effect sizes vary widely, ranging from negligible (e.g., 0.01) to large (e.g., 1.27), with most confidence intervals excluding zero in the manufacturing subgroup but overlapping more in the services subgroup. Heterogeneity tests reveal significant variability across studies (Q = 55.51, p < 0.001), justifying the use of a random-effects model. The between-subgroup difference is not substantial (Q = 1.56, p = 0.20), suggesting that while manufacturing effects are larger on average, the disparity between subgroups may be due to chance. The plot highlights broader consistency in manufacturing outcomes, but greater uncertainty in services, which may be due to smaller sample sizes or contextual differences.

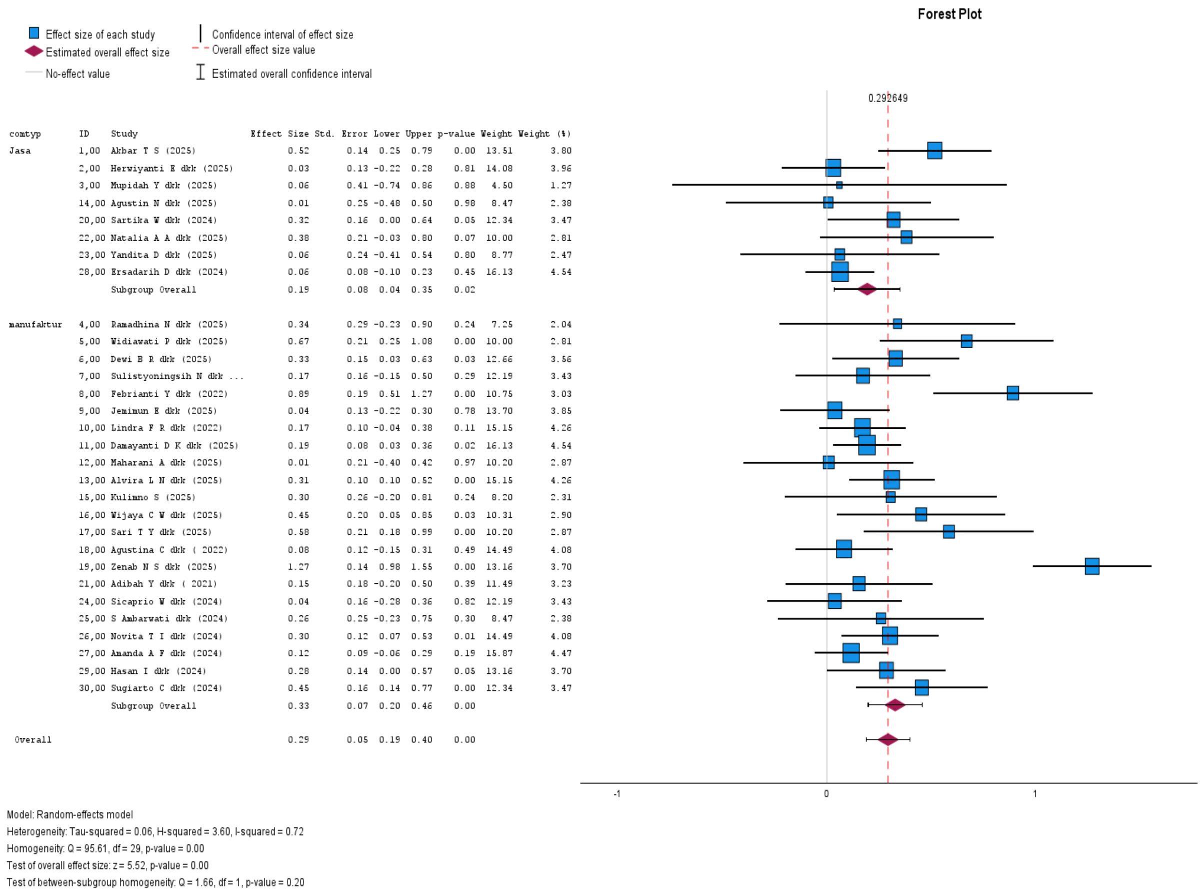

Figure 1. Forest Plot

A funnel plot is a specialised visual tool used in meta-analysis primarily for detecting bias, particularly publication bias, across various studies analysed. This graphical representation plots the treatment effect estimates from individual studies on the horizontal axis against a measure of study size or precision on the vertical axis. The rationale behind the funnel plot's design is that larger studies should be more precise in their effect size estimates, which typically results in a more symmetrical plot resembling a funnel. If the plot is symmetrical, it suggests the absence of publication bias. In contrast, asymmetry may indicate such bias, potentially due to small-study effects, where smaller studies yield results that are systematically different from those of larger studies [25], [26]. The graph (see Figure 2) shows a roughly symmetrical distribution of studies around the estimated overall effect size, suggesting no strong evidence of publication bias. Studies with smaller standard errors (higher precision, typically at the top of the plot) cluster closely near the mean effect, while those with larger standard errors (lower precision, toward the bottom) show more dispersion. The dashed 95% pseudo-confidence intervals form a funnel-shaped boundary, within which most studies fall, further supporting the absence of significant bias. However, minor asymmetries are present, particularly in the lower-left quadrant, where a few studies deviate from the expected pattern. This could indicate a slight underrepresentation of small studies with null or negative effects. The plot includes both service and manufacturing subgroups, with no clear subgroup-specific bias. Overall, the funnel plot reinforces the reliability of the meta-analysis results; however, caution is warranted due to potential minor biases in smaller or less precise studies.

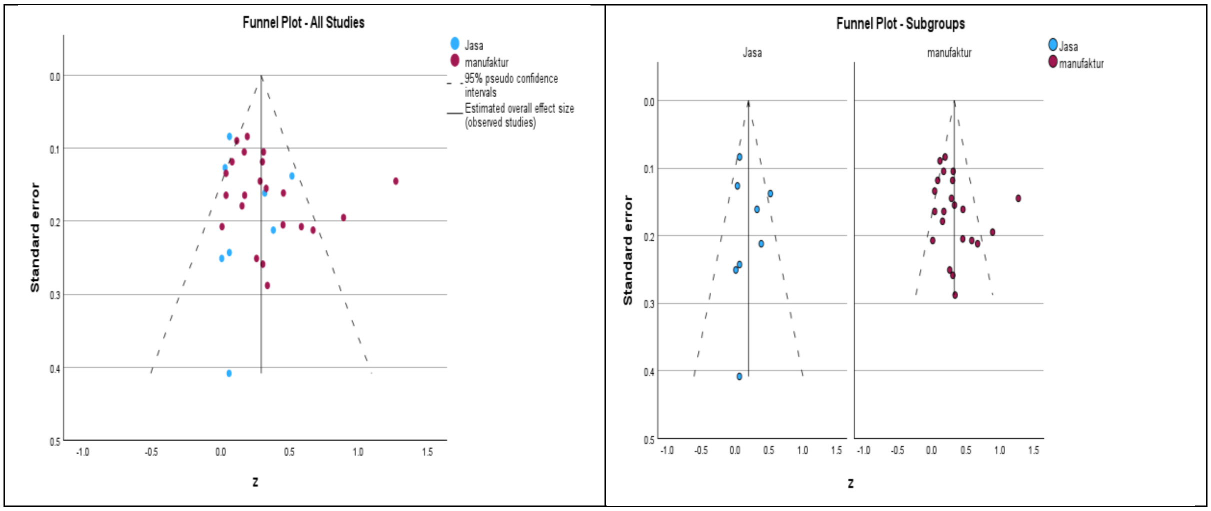

Figure 2. Funnel Plot-all studies and subgroup

IV. CONCLUSION

In conclusion, this meta-analysis provides robust evidence supporting the role of supervisory board independence in mitigating earnings management, with an overall significant negative effect size of 0.25 ($p < 0.001$). The findings reinforce agency theory by demonstrating that independent oversight contributes to more transparent financial reporting. Notably, the stronger effect observed in the manufacturing sector (0.33) compared to services (0.19) suggests that industry-specific factors, such as regulatory scrutiny or operational complexity, may enhance the governance impact of board independence. While significant heterogeneity across studies indicates contextual variations, the absence of subgroup differences implies that sectoral distinctions alone do not fully explain these disparities. The symmetrical funnel plot further validates the reliability of the results by showing minimal publication bias. These insights underscore the importance of promoting board independence as a crucial governance mechanism, particularly in industries prone to earnings manipulation.

V. REFERENCES

[1] S. Alves, "The Effect of Board Independence on the Earnings Quality: Evidence From Portuguese Listed Companies," *Australas. Account. Bus. Finance J.*, vol. 8, no. 3, pp. 23–44, 2014, doi: 10.14453/aabfj.v8i3.3.

[2] K. V. Peasnell, P. F. Pope, and S. Young, "Board Monitoring and Earnings Management: Do Outside Directors Influence Abnormal Accruals?" *J. Bus. Finance Account*, vol. 32, no. 7–8, pp. 1311–1346, 2005, doi: 10.1111/j.0306-686x.2005.00630.x.

[3] B. S. Bhatia, "Board Composition, Ceo Duality and Dividend Policy: A Tobit/Probit Model Approach," *Corp. Gov. Insight*, vol. 3, no. 2, pp. 28–42, 2021, doi: 10.58426/cgi.v3.i2.2021.28-42.

[4] A. Agrawal and S. Chadha, "Corporate Governance and Accounting Scandals," *J. Law Econ.*, vol. 48, no. 2, pp. 371–406, 2005, doi: 10.1086/430808.

[5] T. K. Kaawaase, C. Nairuba, B. Akankunda, and J. Bananuka, "Corporate Governance, Internal Audit Quality and Financial Reporting Quality of Financial Institutions," *Asian J. Account. Res.*, vol. 6, no. 3, pp. 348–366, 2021, doi: 10.1108/ajar-11-2020-0117.

[6] I. A. Abubakar, R. Ishak, and S. Chandren, "The Effect of Board Attributes on Real Earnings Management in Nigerian Financial Institutions," *J. Account. Bus. Finance Res.*, vol. 1, no. 1, pp. 76–83, 2017, doi: 10.20448/2002.11.76.83.

[7] M. E. Bradbury, Y. T. Mak, and S. Tan, "Board Characteristics, Audit Committee Characteristics and Abnormal Accruals," *Pac. Account. Rev.*, vol. 18, no. 2, pp. 47–68, 2006, doi: 10.1108/01140580610732813.

[8] Y. Khan, M. Amjad, DR. S. BATOOL, and O. U. BASHIR, "Corporate Governance Factors Drive Firms' Earnings Per Share: Evidence From Pakistan Stock Exchange Listed Companies," *J. Bus. Tour.*, vol. 2, no. 2, pp. 123–132, 2021, doi: 10.34260/jbt.v2i2.47.

[9] C. Man and B. Wong, "Corporate Governance and Earnings Management: A Survey of Literature," *J. Appl. Bus. Res. Jabr*, vol. 29, no. 2, p. 391, 2013, doi: 10.19030/jabr.v29i2.7646.

[10] A. Prencipe and S. Bar-Yosef, "Corporate Governance and Earnings Management in Family-Controlled Companies," *J. Account. Audit. Finance*, vol. 26, no. 2, pp. 199–227, 2011, doi: 10.1177/0148558x11401212.

[11] M. Khalil and A. Ozkan, "Board Independence, Audit Quality and Earnings Management: Evidence From Egypt," *J. Emerg. Mark. Finance*, vol. 15, no. 1, pp. 84–118, 2016, doi: 10.1177/0972652715623701.

[12] P. Saona, L. Muro, and M. F. H. Alvarado, "How Do the Ownership Structure and Board of Directors' Features Impact Earnings Management? The Spanish Case," *J. Int. Financ. Manag. Account*, vol. 31, no. 1, pp. 98–133, 2020, doi: 10.1111/jifm 12114.

[13] K. A. Daoud, "The Role of the Audit Committee and the Board of Directors in Mitigating the Practice of Earnings Management: Evidence from Jordan," 2018, doi: 10.20472/bmc 2018.008.001.

[14] B. Jaggi, S. Leung, and F. A. Gul, "Family Control, Board Independence and Earnings Management: Evidence Based on Hong Kong Firms," *J. Account. Public Policy*, vol. 28, no. 4, pp. 281–300, 2009, doi: 10.1016/j.jaccpubpol.2009.06.002.

[15] B. G. Osma, "Board Independence and Real Earnings Management: The Case of R&D Expenditure," *Corp. Gov. Int. Rev.*, vol. 16, no. 2, pp. 116–131, 2008, doi: 10.1111/j.1467-8683.2008.00672.x.

[16] S. Khan, Y. Kamal, M. Abbas, and S. Hussain, "Board of Directors and Earnings Manipulation: Evidence From Regulatory Change," *Future Bus. J.*, vol. 8, no. 1, 2022, doi: 10.1186/s43093-022-00173-1.

[17] H. M. Oh and H. J. Jeon, "Does Board Characteristics Constrain Real Earnings Management? Evidence From Korea," *J. Appl. Bus. Res. Jabr*, vol. 33, no. 6, pp. 1251–1262, 2017, doi: 10.19030/jabr.v33i6.10058.

[18] A. Ebrahim, "Earnings Management and Board Activity: An Additional Evidence," *Rev. Account. Finance*, vol. 6, no. 1, pp. 42–58, 2007, doi: 10.1108/14757700710725458.

[19] A. Ghosh, A. Marra, and D. Moon, "Corporate Boards, Audit Committees, and Earnings Management: Pre- and Post-SOX Evidence," *J. Bus. Finance Account*, vol. 37, no. 9–10, pp. 1145–1176, 2010, doi: 10.1111/j.1468-5957.2010.02218.x.

[20] M. S. Sial, X. V. Vo, L. Al-Haddad, and T. Nguyen-Trang, "Impact of Female Directors on the Board and Foreign Institutional Investors on Earning Manipulation of Chinese Listed Companies," *Asia-Pac. J. Bus. Adm.*, vol. 11, no. 3, pp. 288–300, 2019, doi: 10.1108/apjba-10-2018-0189.

[21] I. Zgarni and K. Halioui, "Audit Committee Effectiveness, Audit Quality and Earnings Management: A Meta-Analysis," *Int. J. Law Manag.*, vol. 58, no. 2, pp. 179–196, 2016, doi: 10.1108/ijlma-01-2015-0006.

[22] V. Ahuja and A. Ahuja, "Forest Plot: An Indispensable Segment of Meta-Analysis," *J. Dent. Panacea*, vol. 3, no. 1, pp. 3–8, 2021, doi: 10.18231/j.jdp.2021.002.

[23] S. Sarkar and D. K. Baidya, "Meta-Analysis - Interpretation of Forest Plots: A Wood for the Trees," *Indian J. Anaesth.*, vol. 69, no. 1, pp. 147–152, 2025, doi: 10.4103/ija.ija_1155_24.

[24] A. J. Sutton and J. P. T. Higgins, "Recent Developments in Meta-analysis," *Stat. Med.*, vol. 27, no. 5, pp. 625–650, 2007, doi: 10.1002/sim 2934.

[25] T. Palmer, A. J. Sutton, J. Peters, and S. G. Moreno, "Contour-Enhanced Funnel Plots for Meta-Analysis," *Stata J. Promot. Commun. Stat. Stata*, vol. 8, no. 2, pp. 242–254, 2008, doi: 10.1177/1536867x0800800206.

[26] J. A. C. Sterne and R. Harbord, "Funnel Plots in Meta-Analysis," *Stata J. Promot. Commun. Stat. Stata*, vol. 4, no. 2, pp. 127–141, 2004, doi: 10.1177/1536867x0400400204.