

Accounting Quality and Investment Efficiency: The Role of Female Executives in the Property and Real Estate Sector

Enok Rusmanah^{1*}, Tumpal Manik², Syarifuddin³

¹Akuntansi/Fakultas Ekonomi dan Bisnis, Universitas Pakuan, Bogor, Indonesia

²Akuntansi/Fakultas Ekonomi dan Bisnis Maritim, Universitas Maritim Raja Haji Ali, Kep.Riau, Indonesia

³Akuntansi/Fakultas Ekonomi dan Bisnis, Universitas Papua, Manokwari, Indonesia

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ABSTRACT

This study examines the impact of accounting quality on investment efficiency and investigates the moderating role of female executives in Indonesia's property and real estate sector. Using data from 65 property and real estate companies listed on the Indonesia Stock Exchange (2021–2023), the study employs data panel regression analysis. The results reveal that accounting quality significantly improves investment efficiency by reducing information asymmetry and minimizing inefficient capital allocation. However, the moderating role of female executives is not significant, suggesting that their current representation in managerial positions remains limited to influencing investment outcomes. The findings emphasize the importance of transparent accounting information in enhancing investment efficiency and the potential of gender diversity to strengthen governance in capital-intensive industries

1. Introduction

Investment is important for a country's economic growth as it strengthens production, creates jobs, raises income, expands tax revenues, and promotes innovation. These factors collectively contribute to boosting gross domestic product and supporting sustainable development. Therefore, improving investment efficiency is essential to ensure optimal resource allocation, maximize productivity, and maintain long-term economic stability.

At the micro level, companies often miss opportunities to achieve optimal investment due to information asymmetry, resulting in investment inefficiency. When managers and investors lack equal access to accurate and timely information, firms are more likely to experience inefficiencies in project selection and resource allocation. One key factor influencing investment decisions is the quality of accounting information (Roychowdhury et al., 2019). Higher-quality accounting information is proven to reduce uncertainty and improve investment decision-making processes. Consequently, better accounting quality enhances investment efficiency (G. Biddle & Hilary, 2006).

On the other hand, investment decisions are affected by managerial attributes. The presence of diversity in a company's management as part of a firm's managerial attributes can significantly shape investment decisions (Ullah et al., 2020). One of the diversity forms is female representation in the executives. Female leaders are often characterized by a more cautious and risk-averse approach,

leading them to thoroughly evaluate potential investments before allocating resources (Hurley & Choudhary, 2020). This tendency helps prevent overinvestment in speculative or uncertain projects, contributing to greater investment efficiency. Additionally, female executives are generally associated with higher ethical standards, transparency, and accountability, which improve the quality of financial information and reduce information asymmetry between management and investors (Sattar et al., 2022).

The property and real estate sector is closely linked to extensive investment activities, as it attracts substantial domestic and foreign capital that drives construction, infrastructure development, and urban growth (Pangesti et al., 2024). This sector is characterized by capital-intensive, long-term investments that are highly sensitive to macroeconomic conditions such as interest rates, inflation, and government policies (Indarto & Widodoatmodjo, 2025). Moreover, Indarto & Widodoatmodjo (2025) states that investment efficiency in the property sector has broad economic implications, as this sector generates multiplier effects on other industries such as construction, banking, and building materials. Hence, investment efficiency is crucial to ensure that large amounts of capital are allocated optimally, preventing both overinvestment and underinvestment. Meanwhile, investment inefficiency in this sector often arises due to information asymmetry, speculative project planning, or inaccuracies in asset valuation (Kinatta et al., 2021). In this context, accounting quality and information transparency play an essential role in reducing information gaps between managers and investors, thereby promoting more rational investment decisions.

In the property and real estate sector as well, female executives play an essential role in improving corporate governance quality. Greater female participation enhances accountability, transparency, and overall firm performance (Balqis et al., 2022; Ramdhanian et al., 2020; Valensia et al., 2024). However, there is limited empirical evidence regarding the role of female executives on accounting quality and investment efficiency in the sector. Therefore, this study aims to explore the relationship between accounting quality and investment efficiency in the property and real estate sector, with female executives moderating the nexus. The findings are expected to provide meaningful insights into how improved accounting quality and gender diversity can enhance resource allocation and foster sustainable corporate growth.

2. Literature Review and Hypothesis Development

2.1. Accounting Quality

Investment inefficiency is mostly related to asymmetry information in the companies (Al'Alam & Firmansyah, 2019; Aulia & Siregar, 2018; G. C. Biddle et al., 2009; G. Biddle & Hilary, 2006; Cutillas Gomariz & Sánchez Ballesta, 2014; Roychowdhury et al., 2019). A strive to reduce this phenomenon is by improving the quality of financial information delivered to the external. Study by G. Biddle (2006) evident that higher accounting quality could reduce the asymmetric information and improve investment efficiency. Other provides the argument that financial reporting quality is important in mitigating the investment inefficiency (Al'Alam & Firmansyah, 2019; Aulia & Siregar, 2018; G. C. Biddle et al., 2009; Cutillas Gomariz & Sánchez Ballesta, 2014).

Terms of accounting quality and financial reporting quality are actually fundamentally interconnected, as both determine how accurately and transparently a firm's financial information reflects its true economic condition. Accounting quality refers to financial statements that faithfully represent their actual economic condition and performance. G. Biddle & Hilary (2006) state that accounting quality refers to the extent to which a firm's accounting system provides accurate, timely, and transparent information about its financial performance and position. Meanwhile, financial reporting quality refers to how effectively the accounting information is presented, disclosed, and communicated to external stakeholders (Roychowdhury et al., 2019). Therefore, accounting quality

focuses more on reliable measurement and recognition of financial data (G. Biddle & Hilary, 2006), while financial reporting quality emphasizes more on effective presentation and disclosure (Roychowdhury et al., 2019). Together, they enhance transparency, reduce information asymmetry, and strengthen investor confidence by ensuring financial statements are both credible and decision-useful for stakeholders.

As accounting quality refers to the reliable measurement of accounting numbers, such as earnings or accruals, which is the core of financial reporting quality measurement, this study utilized the variable of accounting quality that represents the quality of accounting information, and employs the accrual quality from McNichols & Stubben (2008) as the measurement of accounting quality, following their reliance on accruals-based measures that reflect the reliability and precision of accounting information.

2.2 Investment Efficiency

According to G. C. Biddle et al. (2009) and Cutillas Gomariz & Sánchez Ballesta (2014), investment efficiency refers to a firm's ability to allocate capital optimally by investing in positive net present value (NPV) projects and avoiding negative NPV investments. Efficient investment decisions ensure that resources are not wasted due to information asymmetry, moral hazard, or adverse selection. They argue that inefficiency arises when firms either over-invest, typically because managers pursue personal interests or have excess cash, or under-invest, often due to financial constraints or limited access to capital. High-quality financial reporting can mitigate these problems by improving transparency, reducing financing frictions, and helping investors and managers better assess investment opportunities. Thus, investment efficiency in G. C. Biddle et al. (2009) framework is achieved when firms' actual investment levels closely match their optimal predicted levels, reflecting reduced distortions from agency or information problems.

Furthermore, similar to G. C. Biddle et al. (2009), Al'Alam & Firmansyah (2019) states that investment efficiency relates to how effectively firms allocate their capital resources to achieve optimal returns by investing in positive NPV projects and avoiding over- or under-investment. Investment efficiency reflects the manager's ability to make rational investment decisions under agency theory, where conflicts may arise between managers as agents and owners or creditors as principals. Al'Alam & Firmansyah (2019) also support that high financial reporting quality helps reduce asymmetry information by improving the transparency and reliability of information, thereby enabling better investment decisions.

2.2. The Role of Female Executives

The presence of females in top management has been proven to contribute to an overall reduction in firm risk, as they enhance governance, oversight, and ethical decision-making (Sattar et al., 2022). Hurley & Choudhary (2020) suggest that gender-diverse leadership teams improve risk management balance, reducing excessive risk-taking while maintaining profitability. This reflects a more strategic and controlled approach to corporate risk, rather than complete avoidance.

According to Purba et al. (2025), the role of gender diversity on corporate boards is theoretically important but empirically limited in its impact on investment efficiency and financial performance within Indonesian manufacturing firms. Other studies, such as Balqis et al. (2022) and Pangesti et al. (2024), also emphasize that gender diversity in leadership enhances oversight, ethical standards, and transparency in financial reporting, which collectively improve accounting quality. These studies suggest that board gender diversity can enhance governance quality by bringing diverse perspectives, ethical awareness, and balanced decision-making, which in theory should strengthen oversight and reduce managerial bias. However, the results show that gender diversity does not

have a significant effect on either investment efficiency or firm performance (Darmawan & Roba'in, 2022; Purba et al., 2025). This insignificant influence is attributed to the low representation of women on corporate boards and the possibility that females in top management are often symbolically appointed (tokenism) rather than given substantial decision-making power. As a result, their potential to influence strategic and investment-related outcomes remains limited.

Previous literature has shown that accounting quality could reduce investment inefficiency by reducing the asymmetric information between managers and investors (Al'Alam & Firmansyah, 2019; Aulia & Siregar, 2018; G. C. Biddle et al., 2009; G. Biddle & Hilary, 2006; Cutillas Gomariz & Sánchez Ballesta, 2014). These studies provide evidence that efficient investment enables firms to secure optimal external financing. Yet, information asymmetry among managers, owners, investors, and minority shareholders often leads to unexpected returns. According to Roychowdhury et al. (2019), high financial reporting quality reduces such asymmetry by minimizing adverse selection and moral hazard. Similarly, G. C. Biddle et al. (2009) assert that financial reporting quality improves investment efficiency by mitigating agency conflicts. Empirical evidence also supports a positive relationship between financial reporting quality and investment efficiency across various contexts (Al'Alam & Firmansyah, 2019; Aulia & Siregar, 2018; Bimo et al., 2022; García Lara et al., 2016). Thus, the hypotheses are formulated below:

H1: Accounting quality positively affects investment efficiency.

In the context of the property and real estate sector, where large capital allocations and long-term projects heighten risk, women's presence in governance roles fosters accountability and better financial disclosure, ensuring that resources are invested more efficiently and aligned with firm value creation goals (Balqis et al., 2022; Pangesti et al., 2024). Hence, the existence of female executives within this sector is expected to help manage optimal investment, which could stimulate production, employment, and innovation, contributing significantly to national economic growth and reflecting broader investment trends in emerging markets (Balqis et al., 2022; Pangesti et al., 2024; Ramdhanita et al., 2020; Sari, 2023).

Triana & Asri (2017) document that the presence of females in executive positions positively influences firm performance in Indonesia. In contrast, Darmawan & Roba'in (2022) report that gender diversity does not have a significant impact on firms' investment efficiency. These mixed findings suggest that female representation in corporate management may not yet be sufficiently influential to yield consistent outcomes across firms. Nonetheless, the presence of females in leadership roles remains an important aspect of corporate governance and decision-making. Accordingly, the following hypothesis is proposed.

H2: Female executives strengthen the positive influence of accounting quality on investment efficiency.

3. Data and Research Methods

3.1 Research Data

This research employs a quantitative method using secondary data from the financial statements of 65 property and real estate companies listed on the Indonesia Stock Exchange (IDX) during 2021–2023. Data were obtained from the Refinitiv Eikon Thomson Reuters database, resulting in 195 firm-year observations. The analysis applies regression models developed by G. C. Biddle et al. (2009) and Cutillas Gomariz & Sánchez Ballesta (2014), and McNichols & Stubben (2008) to assess investment efficiency and accounting quality. Firm size, leverage, and return on

assets are included as control variables, while the proportion of female executives serves as a moderating variable to examine its effect on the relationship between accounting quality and investment efficiency.

3.2 Research Methods

Before hypothesis testing, this study employs the investment efficiency regression model originally introduced by G. C. Biddle et al. (2009) and subsequently modified by Cutillas Gomariz & Sánchez Ballesta in 2014. Investment efficiency reflects the degree to which a firm's actual investment aligns with its optimal level, wherein all projects with positive net present value (NPV) are undertaken. The model estimates investment efficiency by regressing investment on sales growth, with the residuals representing deviations from the expected investment level. A positive residual signifies overinvestment, whereas a negative residual indicates underinvestment, capturing the firm's inefficiency in responding to available economic opportunities.

The model explains the relationship between a firm's future investment and its current sales growth. Investment is measured by calculating the PPE, capital expenditure, research and development, and acquisition costs, multiplying the result by 100, and then dividing it by total assets. Meanwhile, sales growth is defined as the represents of percentage change in revenue from t-1 and t1.

$$\text{Investment}_{i,t+1} = \beta_0 + \beta_1 * \text{Sales Growth}_{i,t} + \epsilon_{i,t+1}$$

Furthermore, this study measures accounting quality using the model proposed by McNichols & Stubben (2008). The model analyzes the association between changes in accounts receivable (ΔAR) and sales, with both variables scaled by total assets to account for differences in firm size. The regression residuals represent abnormal accruals, indicating deviations from normal revenue recognition practices. Larger residuals suggest higher levels of earnings manipulation and lower accounting quality, whereas smaller residuals indicate more accurate and reliable reporting. Therefore, accounting quality is inversely associated with the magnitude of these residuals, where smaller deviations signify superior reporting quality. The model calculate the ΔAR as the change in accounts receivable at t-1 and t1, scaled by total assets t-1. While $\Delta sales$ are computed as a change in the revenue at t-1 and t1, scaled by total assets at t-1.

$$\Delta AR_{i,t} = \beta_0 + \beta_1 \text{Sales}_{i,t} + \epsilon_{i,t+1}$$

3.3 Research Model

To test the hypotheses, this research proposes the primary model with data panel regression. Data panel regression with random effect was chosen after considering the results of the Hausman test as well as the Breusch and Pagan Lagrangian multiplier test. The model explains how accounting quality (AQ) and the presence of female executives (FEx) influence investment efficiency (Inv_eff), while also considering control variables such as firm size, leverage, and profitability. The coefficient β_1 measures the direct effect of accounting quality on investment efficiency, where higher AQ is expected to improve efficiency by reducing information asymmetry. β_2 captures the independent effect of female executives, reflecting how female composition in management

influences decision-making. The interaction term $AQ \cdot FEx$ tests whether female executives moderate the relationship between accounting quality and investment efficiency, indicating whether female executives' composition strengthens or weakens the impact of accounting quality on investment efficiency. Control variables account for firm-specific characteristics, and the error term captures unexplained factors.

$$Inv_eff_{i,t+1} = \alpha + \beta_1 AQ_{i,t} + \beta_2 FEx_{i,t} + \beta_3 AQ_{i,t} \cdot FEx_{i,t} + \beta_j Control_{j,i,t} + \epsilon_{i,t+1} \quad (1)$$

Additionally, the variables used in this study are defined as follows. Accounting Quality (AQ) is measured using accruals based on the discretionary revenue model developed by McNichols & Stubben (2008). Female executives (FEx) represent the proportion of females in the company's management. Meanwhile, firm Size (Size) is determined by the natural logarithm of total assets, while Leverage is calculated as the ratio of total liabilities to total assets. Lastly, Return on Assets (RoA) is measured by dividing net income by total assets, serving as an indicator of the firm's profitability.

4. Results and Discussion

Table 1 presents the descriptive statistics for all variables used in the study. The mean value of Inv_eff is -0.1360 with a standard deviation of 0.1086 , indicating some variation in firms' investment efficiency levels, where negative values suggest potential inefficiency. AQ has a mean of -0.0077 , implying that, on average, firms exhibit a moderate level of discretionary revenue, with relatively low dispersion. The proportion of FEx shows a mean of 2.08 percent but with a high standard deviation (7.65), suggesting substantial variation across firms in terms of gender representation at the executive level.

Table 1. Descriptive Statistics

Variables	N	Mean	SD	Min	Max
Inv_eff	195	-0.1360	0.1086	-0.6144	-0.0075
AQ	195	-0.0077	0.0128	-0.1166	-0.0000
FEx	195	2.0829	7.6533	0.0000	36.3636
Size	195	19.1478	1.5071	15.7391	22.1913
Leverage	195	0.3824	0.2445	0.0020	1.3635
RoA	195	0.0150	0.0695	-0.1869	0.4283

Notes: Inv_eff = Investment Efficiency, AQ = Discretionary revenue model from Stubben and McNichols, 2008, FEx = Percentage of female executives, Size = Logarithm natural total assets, Leverage = total debt / total assets, RoA = Net income after tax / Total Assets.

Meanwhile, Size has an average logarithmic value of 19.15 , indicating that most sampled firms are relatively large. Leverage averages 0.3824 , showing that debt represents about 38 percent of total assets, while the mean of RoA of 0.015 suggests generally low profitability. Overall, the statistics reveal significant heterogeneity across firms in terms of managerial characteristics, capital structure, and performance.

Table 2 documents the Pearson correlation coefficients among the variables used in the study. The results show that Inv_eff is negatively correlated with AQ at -0.0928 , suggesting that poorer accounting quality may slightly reduce investment efficiency, although the relationship is weak and statistically insignificant. Female executive proportion (FEx) exhibits a small positive correlation with investment efficiency (0.0943), implying that firms with higher female representation in executive positions tend to have marginally better investment efficiency. Firm size also shows a weak positive

association with investment efficiency (0.0591), indicating that larger firms may allocate resources more efficiently.

Additionally, AQ is significantly and positively correlated with firm size (0.2360*), suggesting that larger firms generally maintain better accounting practices. RoA shows significant negative correlations with AQ (-0.2986*) and leverage (-0.3520*), indicating that higher leverage and lower accounting quality may reduce firm profitability. Overall, multicollinearity does not appear to be a concern, as correlation values remain below 0.8.

Table 2. Pearson Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Inv_eff	1.0000					
(2) AQ	-0.0928	1.0000				
(3) FEx	0.0943	0.1151	1.0000			
(4) Size	0.0591	0.2360*	0.4532*	1.0000		
(5) Leverage	0.0148	-0.0190	0.0929	0.0344	1.0000	
(6) RoA	0.1270	-0.2986*	0.0629	0.1198	-0.3520*	1.0000

Notes: *** p<0.01, ** p<0.05, * p<0.1; Inv_eff = Investment Efficiency, AQ = Discretionary revenue model from Stubben and McNichols, 2008, FEx = Percentage of female executives, Size = Logarithm natural total assets
Leverage = total debt / total assets, RoA = Net income after tax / Total Assets.

To test the hypotheses, the study employs Equation 1 as the primary model. Table 3 presents the regression results examining the effect of accounting quality (AQ) on investment efficiency (Inv_eff) with female executive proportion (FEx) as a moderating variable. The coefficient of AQ is negative (positive) 0.333 and significant at the 10% level (p = 0.080), indicating that lower (higher) accounting quality is associated with reduced (increased) investment efficiency. This suggests that the result supports the first hypothesis, which explains that when financial information is less reliable, firms are more likely to make inefficient investment decisions due to increased information asymmetry. Further, the coefficient of FEx is positive but insignificant (0.001, p = 0.339), implying that the presence of female executives alone does not have a direct significant effect on investment efficiency.

Table 3. Regression of Accounting Quality on Investment Efficiency

Variables	Coefficients	T-Test	P-Value
AQ	-0.333 *	0.190	0.080
FEx	0.001	0.001	0.339
AQ*FEx	-0.002	0.078	0.984
Size	-0.005	0.010	0.656
Leverage	-0.110 **	0.051	0.030
RoA	0.013	0.047	0.785
Constant	-0.024	0.199	0.905
Observations	195		
R-squared	0.2327		
Wald chi2(8)	22.95		
Prob > chi2	0.0034		

Source: Data process

Notes: *** p<0.01, ** p<0.05, * p<0.1, Inv_eff is the absolute value of residuals of investment model multiplied by -1, AQ is the absolute value of residuals of the model proposed by McNichols and Stubben (2008), multiplied by -1, FEx = Percentage of female executive, AQ*FEx = Moderation of AQ and FEx, Size = Logarithm natural total assets, Leverage = total debt / total assets, RoA = Net income after tax / Total Assets.

The interaction term AQ*FEx (-0.002, $p = 0.984$) is also insignificant, suggesting that female executives do not significantly moderate the relationship between accounting quality and investment efficiency in this sample. This indicates that H2 is not supported and is in line with the study by Purba et al. (2025). Among control variables, leverage shows a negative and significant relationship (-0.110, $p = 0.030$), indicating that higher debt levels tend to reduce investment efficiency. Meanwhile, the R-squared value of 0.2327 implies that the model explains approximately 23% of the variation in investment efficiency, and the model is statistically significant overall (Prob > $\chi^2 = 0.0034$). These findings indicate that accounting quality plays a key role in influencing investment efficiency, while female representation in management does not significantly alter this relationship.

The overall findings provide a comprehensive view of how accounting quality, female executives, and firm characteristics influence investment efficiency. The descriptive statistics show notable variation in investment efficiency and the proportion of female executives, suggesting heterogeneous managerial behavior among firms. The correlation matrix indicates weak associations among most variables, implying minimal multicollinearity and distinct effects. Importantly, unlike the study by Aulia & Siregar (2018) which found that there is no impact of financial reporting quality on investment efficiency, the regression results highlight that accounting quality significantly affects investment efficiency, where lower-quality financial reporting tends to reduce efficiency, consistent with the notion that poor information transparency increases information asymmetry and leads to suboptimal investment decisions. The findings are in line with the studies by G. Biddle & Hilary (2006) which shows that better accounting quality enhances investment efficiency.

Although the proportion of female executives does not directly or significantly influence investment efficiency, their presence may still contribute to better governance and long-term decision-making through non-financial channels. The negative and significant effect of leverage reinforces that firms with higher debt levels face stricter financing constraints, limiting their ability to invest efficiently. Overall, these results emphasize that accounting transparency and prudent financial management are crucial determinants of efficient investment behavior.

5. Conclusion

This study concludes that accounting quality significantly influences investment efficiency, indicating that firms with higher accounting quality are better able to allocate resources effectively and minimize inefficiencies in investment decisions. Poor accounting quality tends to increase information asymmetry, leading to suboptimal investment outcomes. Although the proportion of female executives shows a positive but insignificant impact, their presence may still enhance decision-making discipline and corporate governance through indirect mechanisms. Furthermore, leverage exhibits a negative and significant effect, suggesting that firms with higher debt levels face greater financial constraints that hinder efficient investment allocation. Overall, these findings emphasize the importance of reliable accounting information and sound financial management in promoting more efficient and sustainable investment practices within firms.

This study has several limitations. First, the study is limited by its sample size and scope, which only covers a specific period and industry context. Second, the measurement of accounting quality and investment efficiency relies on proxy models that may not fully capture all dimensions of managerial behavior or external economic factors. Third, the moderating effect of female executives may be underestimated due to their relatively low representation in top management positions.

Therefore, future studies should expand the sample size and include cross-industry or cross-country comparisons to enhance generalizability. Researchers may also explore alternative

measures of accounting quality, such as earnings persistence or accrual quality, to provide more robust evidence. Moreover, incorporating qualitative aspects, such as leadership style, corporate culture, and gender diversity initiatives, could offer deeper insights into how managerial characteristics influence investment efficiency over time.

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