Factors Affecting the Operational Efficiency of Listed Construction Enterprises in Vietnam: Testing the Mediating Role of Integrated Information Disclosure

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Abstract: **-** This study aims to analyze the factors affecting the operational efficiency of listed construction enterprises in Vietnam, while testing the mediating role of integrated information disclosure (IRC). Based on agency theory, resource-based theory, Modigliani–Miller theory, and integrated information disclosure theory, the study employs an unbalanced panel dataset from 49 listed construction enterprises during the period 2019–2024. The full dataset comprises 266 firm-year observations, while 260 firm-year observations are available for regressions involving ROA, ROE, and ATO due to lagged financial data requirements. The research methodology combines qualitative methods (focus group discussions to develop the IRC index) and quantitative methods (multivariate linear regression using FGLS combined with Sobel–Goodman mediation testing), with ROA, ROE, and ATO as dependent variables. The results indicate that firm size (Size), revenue growth rate (Growth), financial leverage (Lev), and firm age (Age) all have positive effects on the level of integrated information disclosure. IRC plays a statistically significant mediating role in the relationship between these four factors and operational efficiency. In contrast, the proportion of independent board members (Num) and Big4 auditing (Audit) do not have a significant impact on IRC. The study contributes to clarifying the transmission mechanism of integrated information disclosure in the construction industry within an emerging market context, while providing practical implications for enterprises and regulators to promote information transparency in order to enhance sustainable operational efficiency.

Key-Words: - Operational efficiency, Integrated information disclosure (IRC), Listed construction enterprises, Vietnam stock market, Agency theory, Financial leverage, Firm size, Mediating effect analysis.

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1 Introduction

The construction industry plays a key role in Vietnam's economic development through infrastructure provision, urbanization, and industrialization. Listed construction firms face pressures related to capital efficiency, risk management, and information transparency. Operational efficiency reflects the ability to utilize resources effectively and is influenced by industry-specific characteristics such as long project cycles, high capital requirements, and financial risks.

According to agency theory, information asymmetry between owners and managers may reduce operational efficiency if effective monitoring mechanisms are absent [1], [2]. Information disclosure helps mitigate this asymmetry, strengthen market discipline, and improve resource allocation efficiency. Previous studies in Vietnam also confirm that disclosure practices affect operational efficiency and investor confidence [3].

Integrated information disclosure (IID), promoted by the International Integrated Reporting Council (IIRC), emphasizes the linkage among strategy, governance, performance, and future prospects [4]. Compared with traditional reporting, IID provides broader information on governance, risks, opportunities, human capital, and socio-environmental impacts.

Recent studies indicate that IID positively affects firm value, audit quality, earnings quality, and market reactions [5], [6], [7]. In Vietnam, IID adoption remains voluntary and is influenced by firm characteristics, governance, and stakeholder pressure [8]. However, existing studies mainly examine either the determinants or direct outcomes of IID, while the mediating role of IID between internal factors and operational efficiency, especially in listed construction firms, remains underexplored.

Therefore, this study investigates factors affecting the operational efficiency of listed construction enterprises in Vietnam and examines the mediating role of integrated information disclosure. The findings contribute to agency theory, resource-based theory, and capital structure theory while providing practical implications for improving transparency and operational efficiency in Vietnam's construction sector.

2 Theoretical Background and Proposed Research Model

2.1 Theoretical Background

This study is grounded in agency theory, resource-based theory, Modigliani–Miller theory, and integrated information disclosure (IID) theory to explain the relationships among firm characteristics, governance, information transparency, and operational efficiency.

Agency theory argues that the separation of ownership and management creates information asymmetry and agency costs, reducing operational efficiency [1], [2]. Information disclosure helps mitigate these problems by enhancing transparency and accountability. In construction firms, characterized by long-term and high-risk projects, IID is particularly important in reducing information asymmetry and improving efficiency.

Resource-based theory states that operational efficiency depends on the effective utilization of valuable tangible and intangible resources, including managerial capability, information systems, and corporate reputation [9]. Firm growth and efficiency rely on the ability to organize and exploit available resources effectively [10]. IID supports this process by communicating business models, strategies, and value creation activities to stakeholders.

Modigliani–Miller theory highlights the impact of capital structure and information asymmetry on the cost of capital and firm performance [11]. Because construction firms often employ high financial leverage, IID helps improve information credibility, reduce financing costs, and enhance operational efficiency.

IID theory, based on the International Integrated Reporting Council (IIRC) Framework, emphasizes the connectivity among financial and non-financial information, strategy, governance, and long-term value creation [4]. Its objective is to provide concise and integrated information that helps stakeholders better understand how firms create sustainable value.

Recent studies confirm that IID improves firm value, audit quality, and operational performance [5], [6], [12]. In Vietnam, the level of information disclosure is influenced by firm characteristics and governance mechanisms and is closely associated with operational efficiency [3], [8].

Overall, theoretical and empirical evidence suggests that IID not only directly affects operational efficiency but also mediates the relationship between internal firm factors and performance outcomes. This provides the basis for developing the research model and hypotheses of this study.

2.2 Proposed Research Model

Based on agency theory, resource-based theory, Modigliani–Miller theory, and integrated information disclosure theory, together with findings from previous studies, the proposed research model is developed to examine the factors affecting operational efficiency through the mediating role of integrated information disclosure, as illustrated in Figure 1.

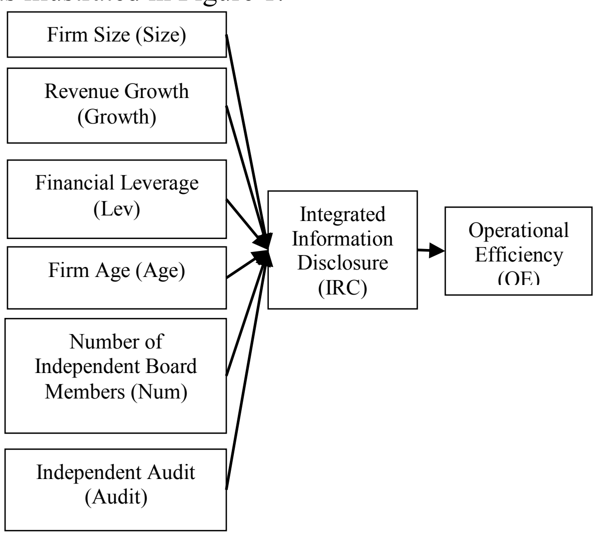

Fig. 1: Proposed Research Model
Source: Created by the authors

2.3 Statistical Hypotheses

Based on the theoretical foundation, the proposed research model, and empirical evidence from previous studies, this study formulates statistical hypotheses regarding the mediating role of integrated information disclosure in the relationship between influencing factors and the operational efficiency of listed construction enterprises in Vietnam as follows:

H1: Integrated information disclosure (IRC) plays a mediating role in the relationship between firm size (Size) and operational efficiency (measured by ROA, ROE, and ATO) of listed construction enterprises.

H2: Integrated information disclosure (IRC) plays a mediating role in the relationship between revenue growth rate (Growth) and operational efficiency (measured by ROA, ROE, and ATO) of listed construction enterprises.

H3: Integrated information disclosure (IRC) plays a mediating role in the relationship between financial leverage (Lev) and operational efficiency (measured by ROA, ROE, and ATO) of listed construction enterprises.

H4: Integrated information disclosure (IRC) plays a mediating role in the relationship between firm age (Age) and operational efficiency (measured by ROA, ROE, and ATO) of listed construction enterprises.

H5: Integrated information disclosure (IRC) plays a mediating role in the relationship between the proportion of independent members of the Board of Directors (Num) and operational efficiency (measured by ROA, ROE, and ATO) of listed construction enterprises.

H6: Integrated information disclosure (IRC) plays a mediating role in the relationship between independent audit (Audit) and operational efficiency (measured by ROA, ROE, and ATO) of listed construction enterprises.

3 Research Methodology

This study combines qualitative and quantitative research methods. The qualitative phase uses focus-group discussions with eight experts, including accounting academics, audit professionals, and senior managers of listed construction firms, to develop an integrated reporting disclosure checklist based on the eight components of the IIRC Framework [4]. The IRC index is constructed using content analysis, with disclosure items coded and validated through expert consensus.

The quantitative phase employs STATA to examine the factors affecting firm performance and the mediating role of integrated information disclosure. Multivariate regression models are estimated using ROA, ROE, and ATO as dependent variables. Independent variables include firm size, firm age, board independence, Big4 auditing, financial leverage, and revenue growth. The analysis tests both the direct effects of these factors and the indirect effects operating through IRC.

The empirical analysis is based on the following regression equations:

$IRC\_it = \alpha0 + \alpha1\ Size\_it + \alpha2\ Growth\_it + \alpha3\ Lev\_it + \alpha4\ Age\_it + \alpha5\ Num\_it + \alpha6\ Audit\_it + \varepsilon\_it$

$OE\_it = \beta0 + \beta1\ IRC\_it + \beta2\ Size\_it + \beta3\ Growth\_it + \beta4\ Lev\_it + \beta5\ Age\_it + \beta6\ Num\_it + \beta7\ Audit\_it + \mu\_it$

where i and t denote firm and year, respectively; IRC is the integrated information disclosure index; and OE is operational efficiency measured alternatively by ROA, ROE, and ATO.

Research object: The impact of factors on the operational efficiency of listed construction enterprises through testing the mediating role of integrated information disclosure.

Research period: The study covers the period 2019–2024 (listed construction enterprises in Vietnam with sufficient data).

Research scope: The study focuses on listed construction enterprises in the Vietnamese stock market.

4 Research Results and Discussion

4.1 Descriptive Statistics

The study uses data from 49 listed construction firms in Vietnam during 2019–2024, yielding 260 firm-year observations for the performance models and 266 observations for the explanatory variables and IRC index. Table 1 presents the descriptive statistics of the research variables.

The average ROA and ROE are 2.28% and 7.25%, respectively, indicating relatively low profitability and substantial variation across firms. ATO averages 30.51 times and shows high dispersion, reflecting significant differences in asset utilisation efficiency among construction firms.

The mean IRC score is 87.11%, suggesting a relatively high level of integrated information disclosure, although disclosure quality varies across firms. The average firm size is 27.71 (log total assets), while revenue growth averages 16.60% but is highly volatile. Financial leverage averages 3.11 times, indicating a strong reliance on debt financing.

Table 1. Descriptive statistics of research variables

Variable	Number of Observations	Mean	Standard Deviation	Minimum Value	Maximum Value
ROA	260	0,0228	0,0334	-0,1453	0,1322
ROE	260	0,0725	0,0891	-0,2819	0,6357
ATO	260	30,5081	132,7839	0,0221	2028,1540
IRC	266	87,1093	12,5516	30,77	100
Size	266	27,7143	1,4261	24,0594	31,0967
Growth	260	16,5954	93,8403	-90,6910	1174,3850
Lev	266	3,1128	7,6228	0,0452	123,1749
Age	266	30,7218	15,5330	9	64
Num	266	0,7019	0,1960	0,2	1
Audit	266	0,2143	0,4111	0	1

Source: Results processed from Stata

The average firm age is 30.72 years, reflecting a mix of established and relatively young firms. Independent directors account for 70.19% of board members on average, exceeding regulatory requirements. Meanwhile, only 21.43% of observations are audited by Big4 firms, indicating that most listed construction companies rely on domestic auditors.

Table 2 presents the correlation matrix among the variables. The correlation results show that IRC is positively associated with ROA (0.7856) and ROE (0.7429), indicating that firms with higher disclosure levels tend to achieve better performance. Growth is also positively correlated with all performance measures, especially ATO (0.8642).

Size, Lev, and Age have positive correlations with IRC and performance, while Num and Audit show weak relationships with most variables. Overall, the correlations are consistent with the expected relationships and support the subsequent regression analysis.

Table 2. Correlation Matrix of the Variables

	ROA	ROE	ATO	IRC	Size	Growth	Lev	Age	Num	Audit
ROA	1,0000									
ROE	0,9550	1,0000								
ATO	0,4304	0,6150	1,0000							
IRC	0,7856	0,7429	0,1815	1,0000						
Size	0,2105	0,1755	-0,0009	0,1875	1,0000					
Growth	0,6369	0,7751	0,8642	0,4232	-0,0191	1,0000				
Lev	0,2650	0,2903	0,2061	0,1320	0,0464	-0,0610	1,0000			
Age	0,2762	0,2708	0,0318	0,3437	0,1226	-0,0211	0,0972	1,0000		
Num	-0,0694	-0,0750	-0,0360	-0,0404	0,0121	-0,0277	-0,0449	-0,0429	1,0000	
Audit	0,0687	0,0475	-0,0386	0,0676	0,4241	-0,0592	0,0179	0,0174	-0,0266	1,0000

Source: Results processed from Stata

4.2 Regression Assumption Tests

Before conducting regression analysis, the study performs necessary diagnostic tests to ensure the suitability of the model.

4.2.1 Multicollinearity Test

Table 3 presents the results of the VIF test:

Table 3. Results of the multicollinearity test

Variable	VIF	1/VIF
Size	1,24	0,8051
Audit	1,23	0,8150
Age	1,03	0,9731
Lev	1,02	0,9841
Growth	1,01	0,9915
Num	1,01	0,9937
Mean VIF	1,09	

Source: Results processed from Stata

The results show that all independent variables have VIF values below 2, with the highest being Size (1.24) and Audit (1.23). The mean VIF of the model is only 1.09, which is far below the commonly used threshold of 10 in empirical studies. This indicates that there is no serious multicollinearity among the independent variables, thereby ensuring the reliability of the regression estimates.

4.2.2 Heteroskedasticity Test

The Breusch–Pagan test is conducted for the regression model of IRC with the independent variables, yielding chi2(1) = 0.24 with a p-value of 0.6264. The p-value greater than 0.05 allows acceptance of the null hypothesis H0, indicating homoscedasticity. This result suggests that the model does not suffer from heteroskedasticity at the 5% significance level.

4.2.3 Panel data Model Selection

The Hausman test yields $\chi^2(6) = 24.45$ ($p = 0.0004$), rejecting H_0 and indicating that the fixed effects (FE) model is more appropriate than the random effects (RE) model. However, the Modified Wald test reports $\chi^2(49)$ = 560,422.42 ($p = 0.0000$), confirming severe heteroskedasticity in the FE model.

To address this issue, the study employs the Feasible Generalized Least Squares (FGLS) model with a panel (h) specification. The Wooldridge test produces $F(1,48) = 0.308$ ($p = 0.5815$), indicating no first-order autocorrelation. Therefore, FGLS is considered the most efficient estimator and is used to examine the effects of the independent variables on IRC.

Although potential endogeneity cannot be entirely eliminated, the use of panel data and key firm-specific control variables helps mitigate this concern. Furthermore, alternative FE estimations generate similar coefficient signs and significance levels, confirming the robustness of the main findings.

4.3 Regression Results of Factors Affecting Integrated Information Disclosure

Table 4 shows that the model is statistically significant (Wald chi² = 495.87; $p = 0.0000$).

Firm size ($\beta = 0.7686$; $p < 0.01$), revenue growth ($\beta = 0.0858$; $p < 0.01$), financial leverage ($\beta = 0.1721$; $p < 0.01$), and firm age ($\beta = 0.1700$; $p < 0.01$) positively and significantly affect integrated information disclosure (IRC). This indicates that larger, older, faster-growing, and more leveraged firms tend to disclose more information.

In contrast, the proportion of independent board members ($\beta = 0.1920$; $p = 0.817$) and Big4 auditing ($\beta = -0.0643$; $p = 0.890$) have no statistically significant impact on IRC.

Overall, firm size, growth, leverage, and age are key determinants of integrated information disclosure, while board independence and audit quality show no significant effect.

Table 4. Regression results of factors affecting IRC

Variable	**Regression Coefficient**	**Standard Error**	**z-value**	**p-value**	**95% Confidence Interval**
Size	0,7686	0,1759	4,37	0,000	[0,4239; 1,1134]
Growth	0,0858	0,0049	17,38	0,000	[0,0761; 0,0955]
Lev	0,1721	0,0392	4,39	0,000	[0,0952; 0,2489]
Age	0,1700	0,0134	12,71	0,000	[0,1437; 0,1962]
Num	0,1920	0,8274	0,23	0,817	[-1,4298; 1,8137]
Audit	-0,0643	0,4635	-0,14	0,890	[-0,9727; 0,8441]
Constant	60,5527	4,9490	12,24	0,000	[50,8528; 70,2527]

Wald chi2(6) = 495.87; Prob > chi2 = 0.0000
Number of observations = 260; Number of groups = 49
Source: Results processed from Stata

4.4 Results of Mediating Effect Tests

4.4.1 Mediating Role of IRC in the Relationship with ROA

Table 5 summarizes the results of the mediating effect tests for ROA:

Table 5. Results of the mediating effect test of IRC in the relationship with ROA

Independent Variable	**Coefficient a (X → IRC)**	**Coefficient b (IRC → ROA)**	**Indirect Effect (a × b)**	**Direct Effect (c′)**	**Total Effect (c)**	**Mediating Ratio**	**p-value**
Size	1,2284	0,0014	0,0017	0,0022	0,0040	43,79%	0,0153
Growth	0,0590	0,0014	0,0001	0,0002	0,0002	35,59%	0,0000
Lev	0,1954	0,0014	0,0003	0,0009	0,0012	23,57%	0,0210
Age	0,2619	0,0014	0,0004	0,0001	0,0005	71,68%	0,0000
Num	-0,6289	0,0014	-0,0009	-0,0042	-0,0051	17,70%	0,8466
Audit	0,8047	0,0014	0,0011	0,0009	0,0021	54,92%	0,6400

Source: Results processed from Stata

The results show that IRC significantly mediates the effects of Size, Growth, Lev, and Age on ROA. The indirect effects are positive and significant for Size (43.79% of the total effect, p = 0.0153), Growth (35.59%, p < 0.001), Lev (23.57%, p = 0.0210), and especially Age (71.68%, p < 0.001), indicating that these factors improve ROA partly through enhancing integrated information disclosure.

In contrast, the mediating effects of board independence and Big4 auditing are not significant (p = 0.8466 and p = 0.6400), consistent with their insignificant impact on IRC.

4.4.2 Mediating Role of IRC in the Relationship with ROE

Table 6 presents the results of the mediating effect tests for ROE:

Table 6. Results of the mediating effect test of IRC in the relationship with ROE

Independent Variable	Coefficient a (X → IRC)	Coefficient b (IRC → ROE)	Indirect Effect (a × b)	Direct Effect (c′)	Total Effect (c)	Mediating Ratio	p-value
Size	1,2284	0,0027	0,0033	0,0052	0,0085	39,25 %	0,0152
Growth	0,0590	0,0027	0,0002	0,0006	0,0008	21,07 %	0,0000
Lev	0,1954	0,0027	0,0005	0,0030	0,0036	14,94 %	0,0209
Age	0,2619	0,0027	0,0007	0,0007	0,0014	51,74 %	0,0000
Num	-0,6289	0,0027	-0,0017	-0,0117	-0,0134	12,80 %	0,8466
Audit	0,8047	0,0027	0,0022	0,0036	0,0058	37,99 %	0,6400

Source: Results processed from Stata

The ROE results are similar to those for ROA. IRC significantly mediates the effects of Size (39.25%, p = 0.0152), Growth (21.07%, p < 0.001), Lev (14.94%, p = 0.0209), and Age (51.74%, p < 0.001) on ROE. Among these variables, Age continues to show the strongest mediating effect, indicating that its impact on performance mainly operates through integrated information disclosure.

In contrast, board independence and Big4 auditing do not have significant mediating effects on ROE, consistent with the ROA results.

4.4.3 The Mediating Role of IRC in the Relationship with ATO

Table 7 presents the results of the mediation test for ATO:

Table 7. Results of the mediation test of IRC in the relationship with ATO

Independent variable	Coefficient a (X→IRC)	Coefficient b (IRC →ATO)	Indirect effect (a× b)	Direct effect (c′)	Total effect (c)	Mediating ratio	p-value
Size	1,2284	-3,7663	-4,6265	4,3017	-0,3248	1424,32%	0,0155
Growth	0,0590	-3,7663	-0,2221	1,4687	1,2466	-17,82 %	0,0000
Lev	0,1954	-3,7663	-0,7359	5,1723	4,4364	-16,59 %	0,0212
Age	0,2619	-3,7663	-0,9862	1,2061	0,2199	-448,49%	0,0000
Num	-0,6289	-3,7663	2,3687	-1,4525	0,9162	258,53%	0,8466
Audit	0,8047	-3,7663	-3,0309	6,2591	3,2282	-93,89 %	0,6400

Source: Results processed from Stata

The ATO results differ from those of ROA and ROE. IRC has a significant negative effect on ATO ($\beta = -3.7663$; $p < 0.001$), suggesting that increased disclosure may be associated with higher fixed-asset investment, reducing asset turnover in the short term.

IRC significantly mediates the effects of Size, Growth, Lev, and Age on ATO, but all indirect effects are negative. For Size and Age, the negative indirect effects offset their positive direct effects, resulting in insignificant total effects. Growth and Lev maintain positive total effects, although the IRC channel weakens these relationships.

Meanwhile, board independence and Big4 auditing continue to show no significant mediating effects. Overall, unlike ROA and ROE, IRC appears to reduce short-term asset utilization efficiency while improving profitability, reflecting the unique characteristics of construction enterprises.

4.5 Discussion of Results

4.5.1 Discussion of the Effects of Factors on Integrated Information Disclosure

The results show that firm size, revenue growth, financial leverage, and firm age positively affect integrated information disclosure (IRC). This is consistent with previous studies [1], [13], [14], [15], indicating that larger, faster-growing, more leveraged, and more experienced firms face stronger transparency pressures and possess greater resources to implement disclosure practices.

In contrast, board independence does not significantly affect IRC, differing from some previous findings [16]. This may reflect the limited effectiveness of independent directors in influencing disclosure decisions within Vietnamese construction firms.

Similarly, Big4 auditing has no significant impact on IRC. This may be due to the low proportion of Big4-audited firms and the narrowing quality gap between Big4 and domestic audit firms. Moreover, integrated information disclosure appears to depend more on corporate strategy and disclosure culture than on auditor requirements.

4.5.2 Discussion of the Mediating Role of IRC

The results confirm that IRC mediates the relationships between firm size, revenue growth, financial leverage, firm age, and operating performance, supporting Hypotheses H1–H4. Larger firms not only benefit from economies of scale but also improve performance through better information disclosure, which reduces information asymmetry and enhances stakeholder confidence. This finding is consistent with prior research [17].

Revenue growth also affects performance through the IRC channel, supporting signaling theory. High-growth firms tend to disclose more information to attract investors, creating a positive link between growth, transparency, and performance. This result is in line with prior research [14].

Similarly, IRC mediates the relationship between financial leverage and operating performance, supporting Hypothesis H3. Greater disclosure helps reduce agency costs and improve transparency, thereby enhancing the efficiency of debt utilization. However, the indirect effect is weaker than the direct effect, indicating that leverage primarily influences performance through financial mechanisms.

Firm age shows the strongest mediating effect, suggesting that long-established firms improve performance mainly through more developed reporting and disclosure systems rather than through experience alone. This finding is consistent with prior research [18].

For ATO, the mediating effect of IRC is negative, indicating that increased disclosure may be accompanied by higher asset investment, which reduces asset turnover efficiency in the short run. Nevertheless, the positive direct effects of firm size and age help offset this impact.

In contrast, IRC does not mediate the relationships between board independence, Big4 auditing, and operating performance, leading to the rejection of Hypotheses H5 and H6. This is because neither variable has a significant impact on integrated information disclosure.

4.5.3 Comparison with Previous Studies

The findings are generally consistent with previous studies that report a positive relationship between IRC and firm performance. Similarly, this study confirms that IRC positively affects ROA and ROE [17], [19]. However, the results differ from prior research that found a negative relationship [20], possibly due to differences between developed and emerging market contexts.

Regarding the mediating role of IRC, the findings support prior research identifying integrated reporting quality as a mediator between firm characteristics and firm performance [21]. However, unlike prior research that focused on ownership structure [12], this study examines firm-specific characteristics as determinants of IRC and performance.

The positive effects of firm size, revenue growth, financial leverage, and firm age are consistent with previous studies [15], [18], [22], [23], [24], [25], [26]. Notably, this study extends the literature by showing that firm age affects performance largely through the IRC channel, highlighting the importance of disclosure systems in transforming experience into performance outcomes.

In contrast, the insignificant effects of board independence and Big4 auditing differ from some international studies [27], [28] but are consistent with evidence from Vietnam [29], [30], [31]. These results suggest that governance and audit quality mechanisms may not yet play a substantial role in promoting integrated information disclosure among Vietnamese construction firms.

4.6 Summary of Hypothesis Testing Results

Table 8 summarizes the results of the research hypothesis testing:

Table 8. Summary of hypothesis testing results

Hypothesis	Description	Result with ROA	Result with ROE	Result with ATO	Overall Conclusion
H1	IRC mediates the relationship between Size → Operatin	Accepted (p = 0.0153)	Accepted (p = 0.0152)	Accepted (p = 0.0155)	Accepted

Hypothesis	Description	Result with ROA	Result with ROE	Result with ATO	Overall Conclusion
	g Performance				
H2	IRC mediates the relationship between Growth → Operating Performance	Accepted ($p < 0.001$)	Accepted ($p < 0.001$)	Accepted ($p < 0.001$)	Accepted
H3	IRC mediates the relationship between Lev → Operating Performance	Accepted ($p = 0.0210$)	Accepted ($p = 0.0209$)	Accepted ($p = 0.0212$)	Accepted
H4	IRC mediates the relationship between Age → Operating Performance	Accepted ($p < 0.001$)	Accepted ($p < 0.001$)	Accepted ($p < 0.001$)	Accepted
H5	IRC mediates the relationship between Num → Operating Performance	Rejected ($p = 0.8466$)	Rejected ($p = 0.8466$)	Rejected ($p = 0.8466$)	Rejected
H6	IRC mediates the relationship between Audit → Operating Performance	Rejected ($p = 0.6400$)	Rejected ($p = 0.6400$)	Rejected ($p = 0.6400$)	Rejected

Source: Results processed from Stata

The results show that 4 out of 6 hypotheses are accepted with a high level of statistical significance. IRC plays a mediating role in the relationships between firm size, growth rate, financial leverage, firm age, and operating performance. However, IRC does not play a mediating role in the relationships between the proportion of independent board members and Big4 auditing with operating performance, because these two variables do not have a significant impact on IRC.

5 Conclusion

This study examines the factors affecting integrated information disclosure (IRC) and its mediating role in the relationship between firm characteristics and operating performance of listed construction firms in Vietnam during 2019–2024. The results show that firm size, revenue growth, financial leverage, and firm age positively influence IRC, while board independence and Big4 auditing have no significant effect.

IRC positively affects ROA and ROE but negatively affects ATO in the short term. Mediation analysis confirms that IRC significantly mediates the effects of firm size, growth, leverage, and age on operating performance, with the strongest mediating effect observed for firm age. In contrast, IRC does not mediate the relationships involving board independence and Big4 auditing.

These findings contribute to the literature by highlighting IRC as an important mechanism through which firm characteristics influence performance in an emerging-market context. The study also provides evidence from the construction industry, where transparency plays a critical role due to long project cycles and high financial risk.

From a practical perspective, construction firms should strengthen integrated information disclosure systems to improve transparency, enhance performance, and reduce capital costs. Policymakers may also consider promoting more standardized IRC practices among listed firms, particularly in high-risk industries.

Despite these contributions, the study has several limitations, including its focus on a single industry, the subjective nature of the IRC scoring method, and the exclusion of nonlinear and moderating effects. Future studies could extend the analysis to other industries or countries and incorporate factors such as ownership structure, institutional environment, and corporate governance quality to better understand the long-term impact of integrated information disclosure.

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Contribution of Individual Authors to the Creation of a Scientific Article

Dr. Dao Thi Nhung conceived the research idea, developed the theoretical framework, designed the research methodology, and prepared the manuscript.
Dr. Pham Thu Huyen supervised the research process, reviewed the methodology, and coordinated the manuscript submission and revision process.
M.A. Tran Thi Hang contributed to data collection, literature review, and construction of the integrated information disclosure index.
M.A. Vu Le Long performed statistical analyses using STATA and contributed to the interpretation of empirical results.
M.A. Nguyen Thi Hong participated in data verification, manuscript editing, and final proofreading.
All authors read and approved the final manuscript.

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Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.