



RESEARCH ARTICLE

The Effectiveness of Internal Control in Construction Firms

Truong Duc Dinh¹, Pham Vu Hoang^{2*}, Pham Van Dang³, Nguyen Van Hau⁴

¹University of Labour and Social Affairs, Vietnam

^{2,3}Hanoi University of Business and Technology, Vietnam

⁴Posts and Telecommunications Institute of Technology, Hanoi, Vietnam

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ABSTRACT

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***Corresponding Author:**

phamvuhoang107@gmail.com

Over the past time, the firm community in Thai Binh in general and construction enterprises in particular have always been creative and innovative and made efforts to overcome difficulties, maintain and expand production and business activities, and actively contribute to the locality on the path of development. Every year, firms create jobs for thousands of workers, contributing billions of VND to the city budget. This study examines the effectiveness of internal control in construction firms in Thai Binh province. The effectiveness of internal control is measured by three components, including EIC1, EIC2 and EIC3. Data was collected through survey questionnaires sent to 350 employees working at construction firms in Thai Binh province. Quantitative research methods are applied to evaluate corporate culture. The results show that the effectiveness of internal control in construction firms (including its three components) is average. There was no difference in the assessment of the effectiveness of internal control in construction firms between respondents with different education levels or between respondents with different career seniorities. Based on the research results, some issues related to the building and development of internal control in construction firms in Thai Binh province are recommended for the following years.

INTRODUCTION

Internal control (IC) in management is considered an indispensable component— the basis for ensuring the safe and stable operation of the organization, helping the organization achieve long-term goals, and maintaining a reliable financial reporting and management system. According to COSO (2013), IC is established to provide reasonable assurance to achieve operational, reporting and compliance goals. In addition, Alvin & James (2000) also concluded that internal control is an effective and efficient management tool for the economic resources of the enterprise, such as people, assets, and capital, contributing to minimizing risks arising in the production and business process and increasing the level of financial reporting to ensure the set goals with the highest efficiency.

The topic of the effectiveness of internal control has received the attention of many domestic and foreign scientists. Studies have provided a scale for measuring the effectiveness of internal control, typically COSO, which has stated that internal control is effective when it reasonably ensures the three criteria of operational objectives, reporting objectives, and compliance objectives.

When studying the current situation of internal control in construction enterprises in Thai Binh province, we found some emerging limitations, such as the assignment of authority and responsibility of collectives and individuals; integrity and ethical values in performing tasks; human resource

policies and talent attraction are still limited; many risks appear in production and business planning, financial risks, production risks, legal risks, and occupational safety and hygiene risks.

It is anticipated that Vietnam's involvement in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) will boost its ability to draw in foreign investment, which will raise demand for the construction of factories and infrastructure. This further demonstrates the crucial role that construction companies play in the integration, industrialization, and modernization processes, but it also presents a significant obstacle for construction companies in Thai Binh province and throughout Vietnam. To boost investor attraction and competitiveness, corporate governance standards, operational efficiency, and information transparency must be continuously improved. Increasing internal control is another way to meet those requirements.

Alongside the rapid development trend of Thai Binh province, which includes the expansion and urbanization of Thai Binh city, as well as the establishment of economic and cultural centers in districts and towns, there has been a significant increase in both the quantity and quality of construction works, encompassing civil construction projects, urban areas, and industrial parks. Therefore, the market of construction enterprises is increasingly expanding, but the competition is becoming more and more fierce. Construction firms in Thai Binh province account for a large proportion, have conditions to apply high science and technology, and have abundant intellectual human resources and good socio-economic conditions. The total number of construction enterprises in Thai Binh province is 595, of which private enterprises account for 3.35%, LLCs 17.94%, and joint stock companies 67.57% (Thai Binh Statistical Office, 2023).

Research to find out the effectiveness of internal control in construction enterprises in Thai Binh province to improve the management capacity of construction enterprises, ensure that construction enterprises operate effectively, meet the goal of providing infrastructure, create conditions for production, business, trade and service activities to develop, and contribute to job creation and increase income for workers... is an urgent requirement today.

LITERATURE REVIEW

Etzioni (1985) stated that effectiveness is the degree of success of an organization in its efforts to achieve its goals. In line with this view, Arens et al. (2023) stated that effectiveness is the degree to which an organization achieves its goals. They defined effectiveness as the relationship between output and purpose, or it can be a measure of the output level of the organization's policies and procedures. Therefore, the important point in evaluating effectiveness is to consider the expected results in the plan with the actual results through activities.

According to INTOSAI GOV 9100 (2004), the effectiveness of internal control is described as reflecting the extent to which the organization's objectives are achieved and the relationship between expected and actual impacts, and the objectives achieved must be cost-effective.

According to COSO (2013), internal control is effective if the Board of Directors and management provide reasonable assurance that three criteria are met: (i) They clearly understand the extent to which the organization's operating objectives are being achieved; (ii) financial statements are being prepared and presented in a reliable manner; (iii) laws and regulations are being complied with. COSO (2013) believes that internal control is a process, and effectiveness is a state or condition of the process being effective at a point in time. Therefore, it is important that managers need to evaluate the effectiveness of internal control regularly.

Research by Millichamp (2002), Amudo and Inanga (2009), Ofori (2011), Douglas (2011), Sultana and Haque (2011), and Gamage et al. (2014) based on the COSO report affirmed that internal control is effective when it achieves three objectives: operations are effective and efficient, financial reporting is reliable, and laws and regulations are complied with. Xuexia, X. & Li, G. (2015) argued that the effectiveness of internal control is the extent to which internal control ensures the ROE target, reliability target and legality target.

According to Nguyen (2023), the internal control of military enterprises is effective when it provides

reasonable assurance for the achievement of the following objectives: The enterprise ensures the completion of assigned plans; the enterprise ensures the debt/equity ratio and has a reasonable debt payment capacity ratio. The enterprise ensures safety in production and other activities; financial reports, financial supervision reports, and other reports of the enterprise are prepared reliably and in accordance with current regulations. The enterprise complies with the legal regimes, policies, and regulations in the fields of investment, management, and use of state capital, taxes, and budget revenues; and the implementation of inspection and examination results.

Inheriting the results of the above studies and based on the opinions of interviewed experts, we determined that the effectiveness of internal control in construction firms in Thai Binh province includes 3 attributes (see Table 1).

Table 1: Attributes (components) of the effectiveness of internal control in construction firms

Code	Description
EIC1	Construction firms achieve production and business performance.
EIC2	Financial statements and other reports of construction firms are prepared reliably and in accordance with current regulations.
EIC3	Construction enterprises comply with legal regimes and policies as prescribed in the fields of bidding, investment, capital management and use, taxes, budget payments, and implementation of inspection and examination results.

Source: Author's synthesis and expert opinion

METHODOLOGY

The study uses a combination of qualitative and quantitative research methods. In the qualitative study, the article is based on theoretical foundations combined with domestic and foreign studies, and at the same time consults experts to explore, build and adjust scales and observation variables suitable for the research object. Quantitative research through a survey of 350 department heads and deputy department heads of construction firms, accounting staff in construction firms in Thai Binh province with 3 years of working experience or more, with university degrees or higher, to measure the effectiveness of internal control in construction firms. The collected survey data will be processed in the following order: collecting the response sheet, coding the necessary data in the questionnaire using SPSS software, conducting descriptive statistics of the collected data, analyzing the reliability of the scale using Cronbach's Alpha coefficient, exploratory factor analysis (EFA), T-Test and ANOVA analysis.

Determining sample size: According to Hoelter (1983), the minimum overall sample size is 200. For research using exploratory factor analysis, Hair et al. (2009) suggested that the minimum sample size should be 50, preferably 100, and the observation/measured variable ratio should be 5:1 (Nguyen, 2011). Accordingly, the minimum number of observations to be collected is $3 \times 5 = 15$ observations. To assess the current status of the effectiveness of internal control in construction enterprises in Thai Binh province, the author conducted a survey of 350 subjects, resulting in 275 valid survey forms (see Table 2), reaching a rate of 78.57%, and proceeded to analyze the data. This study uses EFA analysis and ANOVA analysis; the sample size of 275 survey forms is enough to ensure EFA analysis.

Table 2. Respondents by education level and career seniority

	Frequency	Percent	Cumulative Percent
Education level			
Bachelor of Economics or engineer	158	57.5	57.5
Master or higher	117	42.5	100.0

Career seniority			
From 3 to 5 years	1	4	4
From 5 to 10 years	46	16.7	17.1
From 10 to 15 years	162	58.9	76.0
15 years or higher	66	24.0	100.0
Total	275	100.0	

Source: Prepared by the authors (2024) and SPSS software.

Information on the data collected is shown in Table 2. It shows that among them, 158 are Bachelor of Economics or engineers, accounting for 57.5%, and the rest are Master or higher, accounting for 42.5%. Respondents have career seniority: from 3 to 5 years accounted for 0.4%, from 5 to 10 years accounted for 16.7%, from 10 to 15 years accounted for 58.9%, and the remaining accounted for 24.0%.

RESULTS

Descriptive statistics

Table 3: Descriptive statistics explaining the effectiveness of internal control in construction firms

Code	N	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
EIC1	275	1.0	5.0	3.593	.6738	-1.820	.147	4.279	.293
EIC2	275	1.0	5.0	3.465	.7507	-.794	.147	1.788	.293
EIC3	275	1.0	5.0	3.567	.6768	-1.492	.147	3.379	.293
Valid N (listwise)	275			3.542					

Source: Author's synthesis and from SPSS software

The statistical results from Table 3 show that the survey subjects agree with the variable that the effectiveness of internal control in construction firms includes 3 component attributes as above, which is average, with an average value of 3.542 compared to the highest level of the 5-point Likert scale. All 5 attributes are rated at an average level of 3.465 or higher.

Cronbach's Alpha analysis results

The analysis of the effectiveness of internal control in construction firms was performed using the Cronbach's alpha reliability coefficient. The results in Table 4 show that these attributes have Cronbach's alpha coefficients greater than 0.7, and the correlation coefficients of all attributes are greater than 0.3. Therefore, all attributes of the effectiveness of internal control in construction firms are statistically significant (Hoang & Chu, 2008; Hair et al., 2009; Hair et al., 2014).

Table 4. Results of reliability analysis of scales through Cronbach's alpha coefficient

Cronbach's Alpha	N of Items			
0.940	3			
	Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EIC1	7.033	1.835	.910	.886
EIC2	7.160	1.748	.826	.957
EIC3	7.058	1.843	.897	.896

Source: Author's synthesis and from SPSS software.

Results of exploratory factor analysis (EFA)

The component and variance analysis was used to perform exploratory factor analysis (EFA) in Table 5 and Table 6.

The KMO index is 0.742, greater than 0.5 (>0.5), according to the Bartlett test results used to test the hypothesis about the correlation between observed variables. The extracted variance is 89.660%, meaning that these three observed variables account for 89.660% of the variation in the data. The Bartlett test is statistically significant (Sig. <0.05). Therefore, it can be said that the study's indicators satisfy the requirements of EFA analysis (Hoang & Chu, 2008; Hair et al., 2009; Hair et al., 2014).

These statistics demonstrate that the analysis of research data to explore factors is appropriate. Through ensuring the quality of the scale and testing the EFA model, the author has identified three components of the effectiveness of internal control in construction firms (Hoang & Chu, 2008; Hair et al., 2009; Hair et al., 2014).

Table 5: Results of exploratory factor analysis (EFA) (KMO and Bartlett's Test)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.742
Bartlett's Test of Sphericity	Approx. Chi-Square	812.113
	Df	3
	Sig.	.000

Source: Author's synthesis and from SPSS software.

Table 6: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.690	89.660	89.660	2.690	89.660	89.660
2	.228	7.584	97.244			
3	.083	2.756	100.000			

Source: Author's synthesis and from SPSS software.

Table 7: Component Matrix^a

EIC	Component
	1
EIC1	.963
EIC3	.958
EIC2	.919

Source: Author's synthesis and from SPSS software.

Independent T-test: Education level

A comparison of the results of the evaluation of the differences in the effectiveness of internal control in construction firms with participants of different education levels (Bachelor of Economics, engineer, and master or higher) can be seen in Table 8. According to the results shown in Table 8, sig Levene's test is 0.207, which is more than 0.05. The variance between a Bachelor of Economics, engineer, and master or higher is not different. Moreover, the sig value t-test is 0.031, which is smaller than 0.05, which means that there is a statistically significant difference in the effectiveness of internal control in construction firms between these different education levels (Hoang & Chu, 2008; Hair et al., 2009; Hair et al., 2014).

Table 8. Differences in the effectiveness of internal control in construction firms with participants of different genders with participants of different education levels - Independent Test

	Levene's Test for Equality of Variances	t-test for Equality of Means

		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
EIC	Equal variances assumed	1.600	.207	2.173	273	.031	.17444	.08026	.01643	.33245	
	Equal variances not assumed			2.145	237.419	.033	.17444	.08131	.01426	.33462	

Source: Prepared by the authors (2024) and SPSS software.

ANOVA - career seniority

An ANOVA test was needed to make a comparison of the results of the evaluation of the differences in the effectiveness of internal control in construction firms between the four subjects, including participants who have career seniority from 3 to 5 years, participants who have career seniority from 5 to 10 years, participants who have career seniority from 10 to 15 years, and participants who have career seniority 15 years or higher. Table 9 shows that the sig Levene statistic of 0.113 is larger than 0.05, which means that the hypothesis of homogeneity of variance among the variable value groups (different career seniority) has not been violated. Table 10 shows that sig. is 0.057, which is more than 0.05, which indicates that there is not a statistically significant difference in the effectiveness of internal control in construction firms between the mentioned four groups of career seniority (Hoang & Chu, 2008; Hair et al., 2009; Hair et al., 2014).

Table 9. Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2.195 ^a	2	271	.113

Source: Prepared by the authors (2023) and SPSS software.

Table 10. ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.291	3	1.097	2.542	.057
Within Groups	116.978	271	.432		
Total	120.269	274			

Source: Prepared by the authors (2023) and SPSS software.

The relationship between the effectiveness of internal control in construction firms – career seniority

Next, the line graph shows the relationship between the effectiveness of internal control in construction firms and each respondent's career seniority (Figure 1). Figure 1 shows that this line tends to go down when the respondents have a career seniority of 15 years or higher. But this line tends to slope up when the respondents have a career seniority of from 5 to 10 years and from 10 to 15 years.

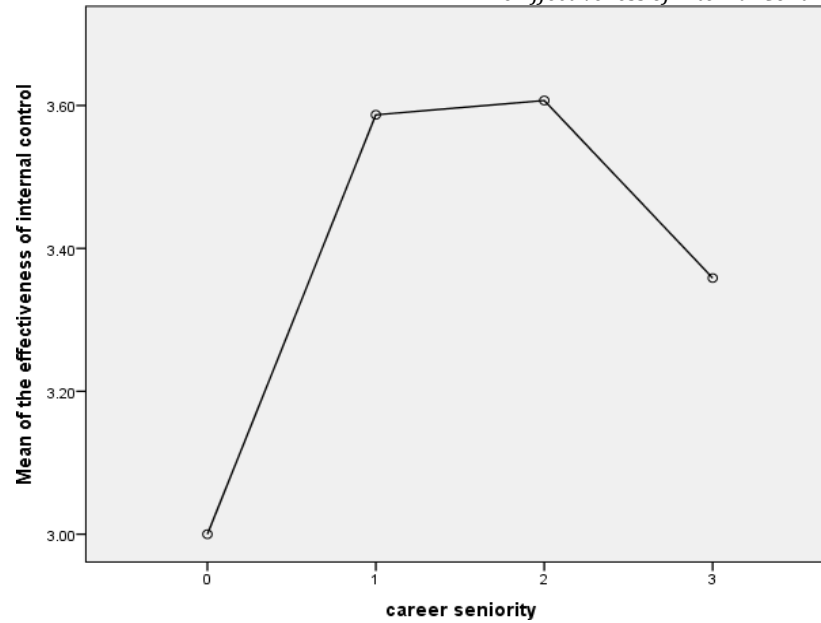


Figure 2: The line graph shows the relationship between the effectiveness of internal control in construction firms and each respondent's career seniority.

Source: Prepared by the authors (2023) and SPSS software.

DISCUSSION AND IMPLICATIONS

Construction firms in Thai Binh province should separate the effectiveness of internal control and the efficiency of internal control. The effectiveness of internal control is the quality of controls that provide an optimal measure of input resources for output results. The effectiveness of internal control focuses on the quality of controls with respect to the achievement of specific management objectives. Managers are asked to rate their level of reasonable assurance regarding the three objectives of internal control.

Construction firms should accelerate the full application of international supervision standards according to the BASE committee.

State management agencies in Thai Binh province should continue to implement synchronous solutions to maintain political stability in parallel with economic stability to ensure a healthy and safe investment and business environment; improve the efficiency of government apparatus at all levels to serve economic development; publicize, be transparent and simplify procedures to improve the production and business environment.

State management agencies should promote the development and completion of the legal document system, creating a legal corridor for the operation of construction firms. Strengthen and coordinate between agencies and ministries to propose and legalize specific mechanisms and policies, such as research and application of science and technology; deploy potential investment projects; develop key products; mobilize state financial resources and economic sectors and enterprises to participate in investment in construction industry development; attract, train, maintain and develop high-quality human resources; encourage, promote and make good use of talents, etc. From here, it helps construction firms to be proactive in implementing activities, contributing to improving the effectiveness and efficiency of business performance.

State management agencies should continue to receive opinions from enterprises and enterprise management agencies through annual assessments of production and business performance of construction firms to continue to complete and supplement regulations on enterprise assessment and classification; forms of rewards; and sanctions for violations in the field of enterprise operations, especially specific regulations on the responsibilities of individuals and collectives related to the loss of capital and assets.

Institutional collectivism: Supervisors must prioritize the group's interests, promote employee loyalty, and improve work coordination among employees.

Assertiveness: Being assertive means making snap judgments and decisions without second thought. Those who have the courage to think, act, and accept responsibility are decisive. It is the antithesis of a peaceful, weak, and unbrave life. Being decisive does not mean being arbitrary or even taking a "risk of death," but rather having the courage and confidence to make decisions based on judgment, understanding the core of the issue, anticipating trends and development directions, etc., in order to defend their own opinions and not let anything else influence them. In actuality, decisiveness or indecision will provide distinct outcomes in leadership and management.

Gender equality is the idea that men and women should have equal roles and responsibilities, be provided with the means and chances to grow their business skills, and share in the rewards of that growth. Hanoi's construction companies are subject to strict rules requiring equal participation by men and women in cultural events. equity in the use of information resources, access, and appreciation of culture.

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REFERENCES

- Alvin, A. & James, K. (2000), *Auditing: An Integrated Approach*, Prentice Hall Inc, Upper Saddle River, New Jersey, USA.
- Amudo, A. and Inanga, L. (2009) Evaluation of Internal Control Systems: A Case Study from Uganda. *International Research Journal of Finance and Economics*, 3, 125-144.
- COSO, (2013). The 2013 Internal Control-Integrated Framework
- Douglas, N. K. (2011). Internal control and its contributions to organizational efficiency and effectiveness: A case study of Ecobank Ghana limited [pdf]. Available at <http://ir.knust.edu.gh/handle/123456789/4210>
- Etzioni, A. (1985). *Organisasi-organisasi modern*. Jakarta. Alih Bahasa Suryatim, Universitas Indonesia: UI Press, Jakarta.
- Gamage, C. T., Kevin Low Lock, AAJ Fernando (2014). A Proposed Research Framework: Effectiveness of Internal Control System in State. *International Journal of Scientific Research and Innovative Technology*, 1(5), 25-44.
- Hair, J., Black, W., Babin, B. & Anderson, R. (2009), *Multivariate data analysis*, Prentice-Hall, New York, USA
- Hair, J. F., Henseler, J., Dijkstra, T., Sarstedt, M., Ringle, C., Diamantopoulos, A., Straub, D., Ketchen, D., GTM, H., & Calantone, R. (2014). Common beliefs and reality about partial least squares: comments on Rönkkö and Evermann. *Organizational Research Methods*, 17(2), 182-209.
- Hoang, T., & Chu, N. M. N. (2008). *Research data analysis using SPSS*, Hong Duc Publishing House. [Vietnamese].
- Hoelter, J. W. (1983), 'The Analysis of Covariance Structures: Goodness-of-Fit Indices', *Sociological Methods and Research*, 11(3), 325-344
- Millichamp, A.H, (2002). *Auditing*, The Bath Press, Bath Eighth edition, 80-150, 349-355.
- Nguyen, D. T. (2011). *Scientific research methods in business*, Labor and Social Publishing House, Hanoi.
- Nguyen, T. T. (2023). Factors affecting the effectiveness of internal control in Vietnamese military enterprises. PhD thesis, National Economics University. [Vietnamese]
- Ofori W, (2011). Effectiveness of Internal Control System: A perception or Reality. Available at <http://ir.knust.edu.gh/bitstream/123456789/4435/1/WILLIAM%20OFORI%20FINAL%20THESIS%202011.pdf> [Access on 25.05.2014]
- Sultana, R., & Haque, M. E., (2011). Evaluation of Internal Control Structure: Evidence from Six Listed Banks in Bangladesh, *ASA University Review*, Vol. 5 No. 1.

Thai Binh Statistical Office. (2023). Statistical Yearbook 2016-2022.

Xuexia, X. & Li, G. (2015), 'An Empirical Study On The Factors Affecting The Effectiveness Of Internal Control Of Listed Corporation -Based On The Perspective Of Corporate Governance', *Wuhan International Conference on eBusiness*, 442- 448.