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The Effect of Internal Control on Profitability of Listed Company in Stock Exchange of Thailand (SET): A Focus on the Construction Services Sector

ผลกระทบของการควบคุมภายในต่อความสามารถในการทำกำไรของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย (SET): กรณีศึกษากลุ่มธุรกิจบริการก่อสร้าง

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Abstract

This study evaluates the effectiveness of internal control systems and their influence on profitability within the construction services sector listed on the Stock Exchange of Thailand during the period 2020–2024. The analysis is grounded in the COSO framework and encompasses 27 companies over a five-year timeframe. Descriptive statistics, correlation analysis, and multiple regression analysis reveal that construction companies demonstrate high internal control implementation levels, however, faced significant profitability challenges during the study period, reflecting the impact of the COVID-19 pandemic, supply chain disruptions, and economic volatility. The most significant finding is that Monitoring Activities emerged as the critical determinant of profitability, showing statistically significant positive associations with GPM. Other COSO components showed no significant direct associations with profitability, suggesting these foundational components may influence performance through indirect pathways.

Keywords: Internal Control, COSO Framework, Profitability, Construction Services, Monitoring Activities, Stock Exchange of Thailand

บทคัดย่อ

การศึกษานี้ประเมินประสิทธิผลของระบบการควบคุมภายในและอิทธิพลที่มีต่อความสามารถในการทำกำไรในภาคธุรกิจบริการก่อสร้างที่จดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทยในช่วงปี พ.ศ. 2563–2567 การวิเคราะห์มีพื้นฐานมาจากกรอบแนวคิด COSO และครอบคลุมบริษัท 27 แห่งในระยะเวลา 5 ปี ผลการวิเคราะห์ด้วยสถิติเชิงพรรณนา การวิเคราะห์สหสัมพันธ์ และการวิเคราะห์การถดถอยพหุคูณ พบว่า บริษัทก่อสร้างมีระดับการนำระบบการควบคุมภายในไปปฏิบัติในระดับสูง อย่างไรก็ตาม ยังคงเผชิญกับความท้าทายด้านความสามารถในการทำกำไรอย่างมีนัยสำคัญในช่วงระยะเวลาที่ศึกษา อันสะท้อนถึงผลกระทบจากการแพร่ระบาดของโรคโควิด-19 การหยุดชะงักของห่วงโซ่อุปทาน และความผันผวนทางเศรษฐกิจ ผลการศึกษาที่สำคัญที่สุด คือ กิจกรรมการติดตามผล (Monitoring Activities) ปรากฏเป็นปัจจัยชี้ขาดด้านความสามารถในการทำกำไร โดยมีความสัมพันธ์เชิงบวกอย่างมีนัยสำคัญทางสถิติกับอัตรากำไรขั้นต้น (GPM) ในขณะที่องค์ประกอบอื่นของกรอบ COSO ไม่แสดงความสัมพันธ์โดยตรงอย่างมีนัยสำคัญกับความสามารถในการทำกำไร ซึ่งบ่งชี้ว่าองค์ประกอบพื้นฐานเหล่านี้อาจส่งผลต่อผลการดำเนินงานผ่านเส้นทางทางอ้อม

คำสำคัญ: การควบคุมภายใน, กรอบแนวคิด COSO, ความสามารถในการทำกำไร, ธุรกิจบริการก่อสร้าง, กิจกรรมการติดตามผล, ตลาดหลักทรัพย์แห่งประเทศไทย

Introduction

As business competition continues to escalate, robust internal control systems serve as an essential element in fostering stakeholder trust and ensuring the sustainability of operations (Committee of Sponsoring Organizations of the Treadway Commission, 2013). This is particularly relevant for companies listed on the stock exchange, as they encounter significant risk management challenges and must adhere to stringent compliance requirements. Over the past decade, both global and Thai economies have been subject to ongoing volatility arising from events such as the global financial crisis, rapid technological advancements, and the COVID-19 pandemic (World Bank Group, 2024). These developments have had a considerable impact on business operations across all industries.

The construction services sector in Thailand is integral to the country's overall development. According to the Office of the National Economic and Social Development Council (2024), the sector's contribution to GDP reached 447.7 billion baht in Q4/2023, representing an 8.3% growth from the previous year. The Bank of Thailand (2024) reports that construction investment grew by 7.2% in 2023, driven by both public and private sector projects. The sector functions as a significant driver of job creation, providing direct employment to roughly 6% of Thailand's total workforce (National Statistical Office, 2023)

The widely accepted internal control framework is COSO, which defines five key components of effective internal control: control environment, risk assessment, control activities, information and communication, and monitoring activities (Committee of Sponsoring Organizations of the Treadway Commission, 2013) Efficient implementation of this framework is a crucial factor that can help reduce operational risks, increase the reliability of financial reporting, and promote regulatory compliance, directly affecting the company's performance and value (Wang & Lakkanawanit, 2021)

According to inspection reports issued by the Securities and Exchange Commission (SEC), numerous listed companies continued to experience internal control deficiencies between 2020 and 2023, particularly within high-risk business segments such as the construction services sector (SEC, 2023). Frequent challenges include insufficient segregation of duties, inadequate financial and accounting controls, as well as ineffective monitoring and evaluation mechanisms. Feng et al. (2015) demonstrated that organizations with robust internal control frameworks typically achieve higher Gross Profit Margin and Net Profit Margin. Furthermore, Gu (2022) identified a correlation between the quality of internal controls and overall financial performance.

Given the critical role of the construction sector in Thailand's economy and the persistent challenges in internal control implementation, this research investigates the relationship between internal control effectiveness and profitability in construction services companies listed on the Stock Exchange of Thailand. The study examines whether robust internal control systems, particularly as operationalized through the COSO framework, translate into superior financial performance in this vital economic sector.

Literature Review

Previous research demonstrates strong links between internal control effectiveness and financial performance across various industries and contexts. Pham et al. (2022) analyzed 30 Vietnamese commercial banks over a period from 2007 to 2018 using the COSO 2013 framework, finding that all five COSO components significantly affect bank profitability measured through ROA and ROE. Similarly, Gu (2022) identified a correlation between the quality of internal controls and overall financial performance, highlighting its universal importance across sectors.

Feng et al. (2015) examined 8,953 firm-year observations, demonstrating that companies with inventory-related material weaknesses have lower inventory turnover ratios and higher impairment likelihood. Critically, companies remediating these weaknesses experienced increases in inventory turnover, sales, gross profit, and operating cash flows, supporting the hypothesis that internal control over financial reporting has significant economic effects on company operations.

In the construction sector specifically, Nashwan (2018) surveyed 46 construction companies in Gaza Strip, achieving a 90.2% response rate. Results showed construction companies demonstrate high commitment to COSO model internal control structures, with statistically significant positive relationships between each COSO element and operational performance. The Stock Exchange of Thailand (2023) examined a Peruvian general services company, finding that despite low internal control levels (62% rated as such), profitability ratios showed improvements, suggesting stronger controls could further enhance financial performance.

In the Thai context, Poonphon et al. (2017) collected data from 301 CEOs of Stock Exchange of Thailand listed companies, finding that internal control success positively affects audit quality ($p<0.1$), which mediates the relationship between internal control and investor confidence ($p<0.05$). Gu & Zhang

(2020) examined Chinese IT companies from 2015-2018, demonstrating that internal control has a positive moderating effect on the relationship between financial flexibility and corporate performance.

While these studies establish internal control's importance for profitability, comprehensive examination of all five COSO components' specific impacts on profitability in Thailand's construction services sector remains limited, representing the gap this research addresses.

Research Objectives

This research aims to achieve two primary objectives. The first objective is to study and evaluate the efficiency of internal control based on the COSO framework of companies listed on the Stock Exchange of Thailand in the construction services sector. The second objective is to analyze the impact of internal control efficiency based on the COSO framework on the profitability of companies listed on the Stock Exchange of Thailand in the construction services sector.

Research Methodology

Research Design

This study employs quantitative research methodology utilizing secondary data collected from publicly available sources. The research is designed to examine the relationship between internal control effectiveness and profitability measures over a five-year period.

Population and Sample

The population for this research consists of 27 companies listed on the Stock Exchange of Thailand (SET) in the Property & Construction industry sector, specifically in the Construction Services subsector. The research employs a census approach by collecting data from all 27 companies. This approach provides comprehensive results that accurately reflect the industry overview.

The study examines annual data from 2020 to 2024, resulting in a total of 135 samples. The period covers several significant events including the COVID-19 pandemic (2020-2022) and post-crisis recovery (2023-2024), enabling the study of the relationship between internal control and profitability under different circumstances, which analyzes trends and patterns in financial data. This also allows the Stock Exchange of Thailand to continuously improve internal control disclosure requirements, adopting the 56-1 One Report format since 2021.

Research Variables

Independent Variables

The independent variables are the effectiveness of internal control based on the COSO Framework 2013, comprising the 5 main components which is further broken down into 17 principles: Control Environment (5 principles), Risk Assessment (4 principles), Control Activities (3 principles), Information and Communication (3 principles), and Monitoring Activities (2 principles).

Dependent Variables

The dependent variables are profitability measures calculated from financial statements: Gross Profit Margin (GPM), Net Profit Margin (NPM), Return on Assets (ROA), and Return on Equity (ROE).

Control Variables

To ensure the robustness of the findings, Company Size, measured by total assets, was included as a control variable in all regression models. This approach allowed for isolating the specific effects of internal control components on profitability while accounting for company-specific characteristics that may influence financial performance.

Conceptual Framework

This study bases its conceptual framework on the COSO Internal Control Framework (2013), which states that successful internal control systems are made up of five interconnected components. This study examines how each individual component affects profitability, while using company size as a control variable. Figure 1 illustrates the research framework.

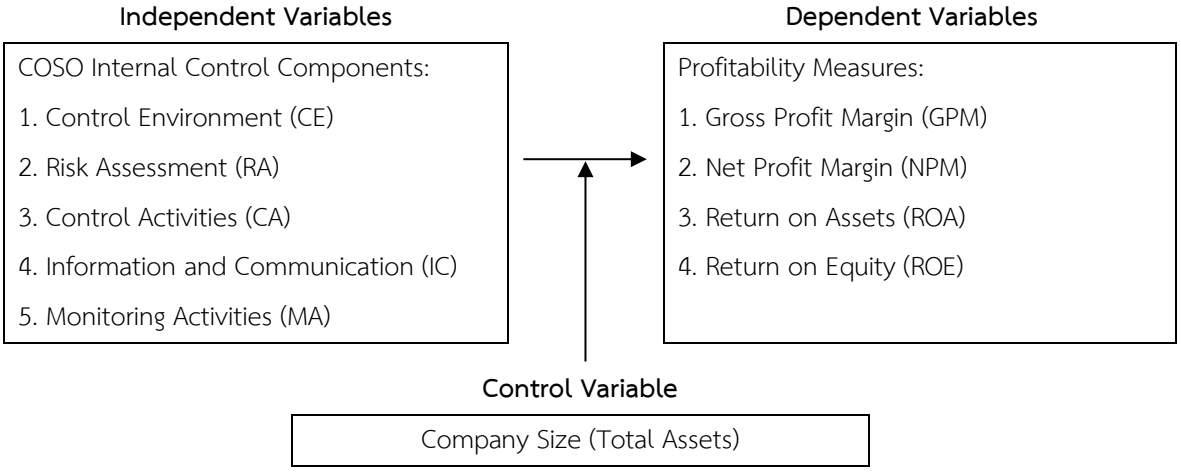


Figure 1. Research Conceptual Framework

Source: Adapted from COSO Framework (2013)

Data Collection and Analysis

Data collection involves two primary sources; internal control data from companies' 56-1 One Report submitted to the Stock Exchange of Thailand, and financial data from audited financial statements. Each of the 17 COSO principles is evaluated using binary scoring (1 = implemented, 0 = not implemented or insufficient evidence). Data analysis employs descriptive statistics, correlation analysis, and multiple regression analysis using Ordinary Least Squares (OLS) regression models.

Research Results

Descriptive Statistics

Internal control implementation among the sampled construction companies is exceptionally high, with an average total internal control score of 15.70 out of 17 (92.4%). This finding is particularly significant as it indicates that Thai construction companies have made substantial investments in establishing robust

governance and control systems. The high implementation levels across all five COSO framework components suggest strong commitment to corporate governance among publicly listed companies.

Despite this high level of internal control compliance, profitability remained severely weak during the 2020–2024 study period. The descriptive statistics show average GPM of 9.12%, NPM of -2.99%, ROA of 0.02%, and ROE of -4.84%. The positive GPM of 9.12% indicates that companies generally preserved project-level pricing and maintained direct cost control on the ground. However, this operational efficiency did not translate into final profitability, as evidenced by the negative NPM (-2.99%). This profound erosion of earnings was driven by high operating expenses, mounting interest burdens, delayed collections, high fixed costs, and intensely volatile economic conditions.

The root causes of this negative profitability link directly to the macroeconomic shocks of the period. The COVID-19 pandemic caused widespread project suspensions, severe labor shortages, and postponed investment decisions. Even post-pandemic, supply chain disruptions and surging prices of steel, cement, and fuel heavily impacted the sector. Because many companies operated under fixed-price contracts, they possessed limited ability for cost pass-through to clients. Consequently, the near-zero ROA (0.02%) reflects the sector's capital-intensive structure combined with drastically reduced asset utilization. Furthermore, the negative and highly volatile ROE (-4.84%) was the result of accumulated losses, weak and deteriorating equity bases, and the amplifying effects of high financial leverage in a distressed economic environment.

Multiple Regression Analysis

The multiple regression analysis isolated the specific impacts of each COSO component on the four profitability measures. Table 1 summarizes these findings.

Table 1. Summary of Multiple Regression Analysis Results

Independent Variable	GPM **β (p-value)**	NPM **β (p-value)**	ROA **β (p-value)**	ROE **β (p-value)**
Control Environment (CE)	0.089 (0.374)	0.067 (0.512)	0.102 (0.312)	-0.024 (0.823)
Risk Assessment (RA)	0.134 (0.189)	0.098 (0.345)	0.087 (0.398)	0.045 (0.678)
Control Activities (CA)	**0.255** (0.008)**	0.156 (0.123)	0.178 (0.089)	0.067 (0.534)
Information & Communication (IC)	0.112 (0.267)	0.089 (0.389)	0.095 (0.356)	-0.012 (0.912)
Monitoring Activities (MA)	**0.363*** (<0.001)**	**0.246** (0.008)**	**0.322*** (0.001)**	0.078 (0.467)
Company Size (Control Variable)	-0.045 (0.654)	-0.067 (0.512)	-0.089 (0.389)	0.034 (0.745)
R^2	**0.287**	**0.198**	**0.245**	**0.056**
Adjusted R^2	**0.254**	**0.161**	**0.210**	**0.012**
F-statistic (p-value)	**8.67 (<0.001)**	**5.34 (0.003)**	**6.98 (0.001)**	**1.27 (0.289)**

*Note: *** p < 0.001, ** p < 0.01, * p < 0.05. Highlighted row indicates the most significant predictor. n = 135 observations (27 companies × 5 years). GPM = Gross Profit Margin, NPM = Net Profit Margin, ROA = Return on Assets, ROE = Return on Equity.*

Other Findings

Control Activities emerged as the second most important internal control component, showing a statistically significant positive association with Gross Profit Margin (β = 0.255, p = 0.008). However, Control Activities showed significant impact only on Gross Profit Margin, with no significant associations found for Net Profit Margin or Return on Assets.

Three of the five COSO framework components—Control Environment, Risk Assessment, and Information and Communication—showed no statistically significant direct associations with any profitability measure in the multivariate regression models. These foundational components may impact profitability indirectly by influencing other control components rather than through direct effects.

One distinctive finding is the complete absence of significant relationships between any internal control component and Return on Equity, attributed to the extreme volatility of this measure in the sample with a standard deviation of 185.77%. Company size showed no significant associations with any profitability measure, suggesting that larger construction companies do not systematically achieve better or worse profitability than smaller companies, controlling for internal control effectiveness.

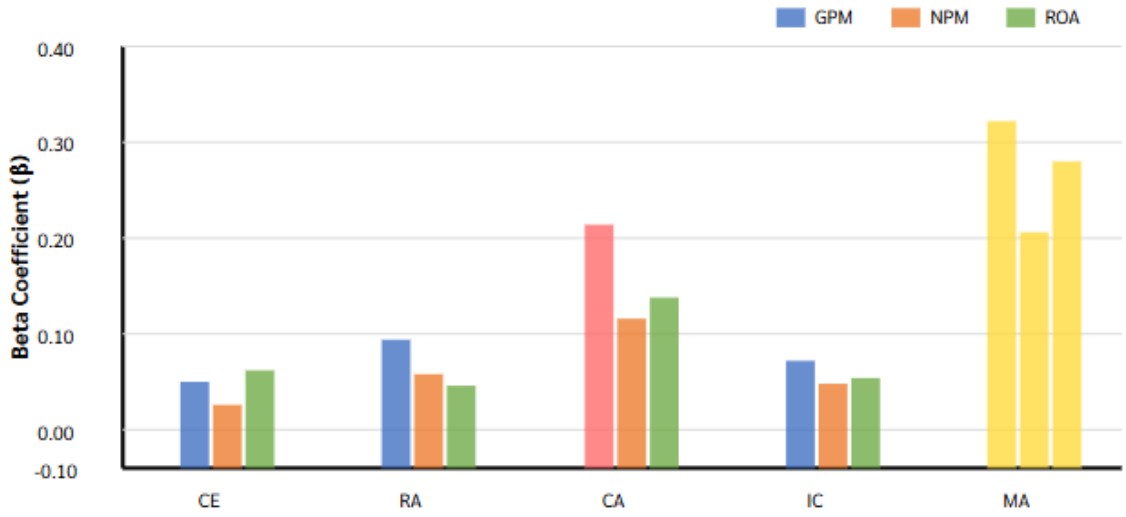


Figure 2. Comparative Impact of COSO Components on Profitability Measures

Note: CE = Control Environment, RA = Risk Assessment, CA = Control Activities, IC = Information & Communication, MA = Monitoring Activities. Yellow highlighted bars indicate statistically significant relationships (p < 0.01).

Discussion

The findings explicitly demonstrate that Monitoring Activities (MA) is the dominant and most critical internal control factor driving profitability in the construction sector. It showed statistically significant positive associations with GPM (β=0.363, p<0.001), NPM (β=0.246, p=0.008), and ROA (β=0.322, p=0.001). This strongly aligns with the literature, notably extending Nashwan's (2018) findings by isolating monitoring as the primary differentiator in complex, project-based environments where detecting cost overruns and operational deviations in real-time directly protects margins. Control Activities (CA) was also significant, but only for GPM (β=0.255, p=0.008), indicating that operational controls matter mainly at the gross margin level (e.g., direct material and labor controls) before heavy corporate overhead and financial costs dilute their impact on net earnings.

Interestingly, Control Environment, Risk Assessment, and Information & Communication showed no significant direct effects on any profitability measure. This contrasts with Pham et al. (2022), who found all five COSO components significant in Vietnamese banks. The lack of significant direct effects in this study can be attributed to several factors. First, these foundational components operate through indirect pathways, serving as an enabling infrastructure rather than direct profitability drivers. Second, the uniformly high implementation scores across the sample (92.4% average) created a "ceiling effect," reducing the statistical variance necessary to detect direct performance linkages. Lastly, the severe crisis-period distortion may have overshadowed the subtle benefits of generalized risk assessment and control environments. However, as Escobar Krungsri (2023) suggested, profitability can improve even when foundational internal control is weak, provided that key operational controls and monitoring are strengthened.

The ROE model yielded neither statistical significance nor practical explanatory value (R^2=0.056, Adjusted R^2=0.012, F=1.27, p=0.289). ROE proved to be a distorted metric in this context due to the extreme volatility of equity bases ravaged by accumulated losses and heavy debt reliance. Conversely, the model explanatory power for the other metrics was highly informative: GPM (R^2=0.287, Adjusted R^2=0.254, F=8.67, p<0.001), NPM (R^2=0.198, Adjusted R^2=0.161,
F=5.34, p=0.003), and ROA (R^2=0.245, Adjusted R^2=0.210, F=6.98, p=0.001). These Adjusted R^2 values (ranging from 16.1% to 25.4%) clearly interpret that while internal control matters significantly, a large share of profitability variation is still explained by external macroeconomic shocks and firm-specific strategic factors outside the COSO framework.

Ultimately, these findings echo Feng et al. (2015); Gu and Yuan (2020); and Gu & Zhang (2022), affirming that high-quality internal controls, especially robust monitoring and remediation activities, act as a positive moderator for corporate performance. Moreover, reflecting Poonphon et al. (2017), effective internal control should be framed not merely as a regulatory compliance checklist, but as a strategic asset that preserves value and investor confidence during periods of economic instability.

Conclusions

This research provides compelling evidence that among the five COSO framework components, Monitoring Activities stands as the decisive factor influencing profitability in Thailand's construction services sector. Despite the industry achieving 92.4% internal control implementation, the differential impact of control components reveals that operational excellence depends not merely on having controls in place, but on actively monitoring their effectiveness. The study's most significant contribution is demonstrating that quality of monitoring trumps organizational scale—medium-sized companies with robust monitoring systems can compete effectively against larger corporations. For practitioners, this transforms internal control from a regulatory checkbox into a strategic lever for financial performance, particularly vital during periods of economic uncertainty such as the COVID-19 pandemic experienced during the study period.

Suggestions

Recommendations for Construction Services Companies

Companies should prioritize investment in and continuous improvement of their monitoring systems and capabilities, including implementing robust ongoing monitoring systems providing real-time visibility into project performance, strengthening periodic evaluations through comprehensive internal audit programs, improving deficiency tracking and correction processes, and leveraging technology and data analytics to enhance monitoring efficiency.

Companies should strengthen control activities particularly those most directly linked to project cost management and operational efficiency, maintain strong foundational control components (Control Environment, Risk Assessment, and Information and Communication), and adopt a comprehensive, multi-dimensional approach to performance measurement that emphasizes operational indicators alongside traditional financial measures.

Recommendations for Regulators and Standard Setters

Regulators should consider strengthening disclosure requirements specifically related to monitoring activities, facilitate sharing of best practices in internal control implementation across the construction industry, and support capacity building initiatives helping construction companies develop robust internal control systems through training programs, guidelines, and resources.

Suggestions for Future Research

Future research should examine whether the dominance of Monitoring Activities for profitability extends to other industries through cross-industry comparative studies, complement quantitative scoring with qualitative assessment of internal control implementation quality, track companies over time as they implement internal control improvements to provide stronger causal evidence, investigate the indirect pathways through which foundational control components influence profitability using structural equation modeling or path analysis, and examine how digital technologies and automated controls affect the relationship between internal control and profitability.

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