

RESEARCH PAPER

Total quality management practices and financial performance in Vietnamese hotels: the moderating roles of market turbulence, competitive intensity, and technological turbulence

Phuong Trieu Dinh¹, Anh Phan Chi², Thuy Dam¹

¹Thuyloi University, Dong Da, Ha Noi.

²University of Economics and Business / Vietnam Nation University, Ha Noi, Ha Noi.

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ABSTRACT

Purpose: This study examines the relationship between TQM practices and hotels' financial performance in Vietnam, with particular attention to the moderating roles of market turbulence, competitive intensity, and technological turbulence.

Design / methodology / approach: Data were collected from managers at different levels in 185 hotels rated three stars or above across various regions of Vietnam. Structural equation modeling was employed, using AMOS, to test the proposed research model and hypotheses.

Findings: The results show that TQM practices positively affect hotels' financial performance. Market turbulence and competitive intensity significantly strengthen this relationship, whereas technological turbulence does not show a significant moderating effect.

Limitations of the study: This study uses cross-sectional, self-reported data and focuses on perceived financial performance. Future studies could use longitudinal and objective financial data, include non-financial outcomes such as customer and employee satisfaction, and further examine how digital capability shapes the role of technological turbulence.

Practical implications: The findings suggest that hotel managers should continuously monitor changes in the external business environment, especially market turbulence and competitive intensity. By doing so, they can adjust their internal quality management practices more effectively to improve financial outcomes.

Originality / value: This study contributes to the literature by providing empirical evidence on the financial impact of total quality management practices in the Vietnamese hotel sector. Its distinctive contribution lies in examining how external environmental conditions shape the effectiveness of total quality management practices in enhancing hotel financial performance.

Keywords: Total quality management; TQM; External environmental factors; Hotels' financial performance; Market turbulence; Competitive intensity; Technological turbulence.

1 INTRODUCTION

Quality management has become a widely accepted managerial approach for achieving effective operations and competitive survival in service sectors. Total Quality Management (TQM), in particular, emphasizes organization-wide continuous improvement and process alignment to meet customer needs and create superior customer value (Wang et al., 2012). However, performance outcomes from quality management practices can vary, and the strength of these links may depend on contextual moderators and how TQM is implemented (Nanjundeswaraswamy et al., 2023).

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Corresponding author: thuydt@tlu.edu.vn

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In the hospitality industry, where customer experience is central to value creation, TQM has been examined as a pathway to enhance hotel performance. Prior evidence suggests that TQM can positively influence hotel outcomes, but this relationship may also be contingent on environmental conditions such as competitive intensity, market turbulence, and technological turbulence. Thus, hotels may benefit from adopting TQM as an integrated management system rather than as isolated quality initiatives.

Despite the growing international literature, the mechanisms through which TQM contributes to hotel outcomes remain context-sensitive, particularly in emerging tourism markets. Recent evidence from Vietnamese hotels in Da Nang shows that TQM practices, including process management, leadership, technology adoption, and workforce-related practices, are associated with organizational innovation and indirectly with labour productivity (Nguyen et al., 2025). This suggests that the financial value of TQM merits further testing in Vietnam.

Vietnam's tourism and hospitality sector provides a relevant empirical context. Since the reopening of international borders, Viet Nam has recorded nearly 17.5 million international arrivals, 110 million domestic trips, and total tourism receipts of about VND 840 trillion (Ministry of Culture, Sports and Tourism, 2025). Meanwhile, the accommodation market remains highly competitive, with around 38,000 tourist accommodation establishments and more than 780,000 rooms by the end of 2023, including 247 five-star and 368 four-star properties. This expansion has intensified pressure on hotels to improve service quality, operational efficiency, and financial outcomes. However, the effectiveness of TQM may vary across hotels because external environmental conditions can shape the extent to which internal quality management practices generate financial benefits.

Therefore, this study examines the influence of external environmental factors on the relationship between TQM practices and hotels' financial performance in Vietnam. It addresses two research questions:

How do TQM practices affect hotels' financial performance in Vietnam?

How do external environmental factors, including market turbulence, competitive intensity, and technological turbulence, moderate the relationship between TQM practices and hotels' financial performance in Vietnam?

Data were collected from 185 three-star or higher hotels in Hanoi, Da Nang, and Ho Chi Minh City. Using structural equation modeling, the study provides empirical evidence on the moderating influence of external environmental factors and offers practical implications for hotel managers in adapting quality practices to environmental changes.

2 LITERATURE REVIEW

2.1 Research on TQM practices in hotels

Prior research has confirmed the relevance of TQM practices in the hotel industry. Claver-Cortés et al. (2006) show that quality systems support hotels in improving service quality, developing a quality-oriented culture, enhancing operational efficiency, and strengthening hotel image. Wang et al. (2012) also emphasize the importance of TQM practices in hotels under changing business environments, while Al-Ababneh (2021) examines the critical success factors required for TQM implementation. These studies indicate that TQM has been widely examined as a managerial approach for improving hotel operations and performance.

A second group of studies focuses on soft TQM practices, which are people-oriented and managerial practices such as leadership, employee involvement, customer focus, training, empowerment, and quality culture. Bouranta et al. (2017) identify top management quality practices, strategic quality planning, staff quality management, customer focus, and employee education as important TQM dimensions in the Greek hospitality industry. Khan et al. (2020) and Jusoh et al. (2018) further highlight human resource-related processes, internal cooperation, customer focus, and leadership as important mechanisms for improving quality in hotels. Similarly, Jabbarzare and Shafighi (2019) show that continuous improvement, customer focus, and employee involvement are associated with organizational performance in Malaysian hotels.

In contrast, hard TQM practices refer to technical and process-oriented practices, including process management, quality data and reporting, quality control, quality tools and techniques, benchmarking, and service design. Hussain and Khan (2020) classify TQM practices into hard and soft dimensions and argue that both are relevant to hospitality organizations. ElShaer and Shaker (2020) further suggest that hard TQM practices, particularly quality data and reporting and process management, play an important role in linking TQM implementation with financial outcomes.

In Vietnam, empirical research on TQM practices in hotels remains limited. Bach (2016) analyzed the impact of TQM on hotels in Da Lat and found that customer focus, responsiveness to

employees, continuous improvement, process improvement, and learning significantly influenced the service environment. However, the study's generalizability is limited because it only sampled hotels in Da Lat and used relatively simple analytical methods.

Overall, the reviewed studies show that TQM practices are important in hotels and are commonly conceptualized through people-oriented and process-oriented dimensions. Therefore, this study examines TQM practices as a multidimensional construct in a broader Vietnamese hotel context, represented by five dimensions: top management commitment, customer focus, employee involvement, continuous improvement, and process management.

2.2 The impact of TQM practices on hotels' financial performance

Studies on the impact of TQM practices on financial performance have shown mixed results, especially in hotels. In this study, financial performance was initially measured using four items: market share, sales, increased return on investment, and reduced costs. After CFA-based scale purification, the sales item was removed, and the final scale retained three indicators: market share, increased return on investment, and reduced costs. This clarification is necessary because many TQM studies examine broader outcomes, such as service quality, customer satisfaction, operational efficiency, and employee outcomes, rather than direct financial indicators.

Empirical studies using explicit financial indicators generally support the TQM–financial performance relationship. Easton and Jarrell (1998) found that firms adopting TQM achieved improved financial performance, especially those with advanced TQM systems. In hotels, Augustyn et al. (2021) found that multidimensional quality management positively affected financial performance, while ElShaer and Shaker (2020) confirmed that both soft and hard TQM practices contribute to financial performance, with quality data and reporting and process management showing direct effects.

However, other studies report weak or insignificant effects. Yeung et al. (1998) found no improvement in operational efficiency or financial performance among Hong Kong manufacturing firms implementing quality management systems. Watson et al. (2003) found no positive financial impact of TQM adoption among Australian SMEs, and Albacete-Sáez et al. (2011) did not identify a direct relationship between quality-related activities and financial outcomes. These mixed findings may result from superficial TQM implementation, external pressure-driven adoption, initially weak financial positions, or the time lag required for financial benefits to appear (Spendlove, 1997; Guilhon et al., 1998; Sun and Cheng, 2002; Watson et al., 2003; Wali and Boujelbene, 2011).

In the hotel sector, several studies indicate that TQM practices positively influence financial performance, although the effects may vary across soft and hard TQM practices (Wang et al., 2012; Bouranta et al., 2017; ElShaer and Shaker, 2020; Thuy and Anh, 2025a; Thuy and Anh, 2025b). Given limited evidence from Vietnamese hotels, this study examines whether overall TQM practices improve hotels' financial performance, measured by market share, increased return on investment, and reduced costs.

2.3 The influence of external environmental factors on the relationship between TQM practices and business performance of enterprises

Previous studies have examined the TQM–performance relationship under different external environmental conditions. Prajogo and Sohal (2001) argue that TQM implementation and outcomes depend on market conditions, implying that TQM may produce different results for quality, innovation, and business performance across environments.

In hotels, Wang et al. (2012) suggest that intensified competition requires sufficient resources and flexible approaches to meet changing market demands. They show that external environmental factors can moderate the relationships among TQM, market orientation, and hotel performance, especially under substantial environmental change.

Ng et al. (2015) similarly find that TQM effectiveness depends on environmental uncertainty, although they treat it as a broad construct rather than distinguishing market turbulence, competitive intensity, and technological turbulence. Haroon and Shariff (2016) and Nasim (2018) also link TQM practices, external environmental factors, and business performance, but their studies are mainly conceptual or conducted outside the hotel context. Therefore, more empirical evidence is needed on how specific environmental factors influence the relationship between TQM practices and financial performance.

This gap is particularly relevant after COVID-19, when hotels faced volatile markets and stronger competition. Effective TQM implementation may help hotels respond to such pressures by

improving service quality, reducing errors and waste, increasing customer value, and enhancing process efficiency.

To provide a clearer review of the external environment, the following subsections examine three specific dimensions: Market turbulence, Competitive intensity, Technological turbulence.

Market turbulence

Previous studies have examined market turbulence as an external environmental factor that may influence the implementation and effectiveness of managerial practices, including TQM practices. In the context of hotels, market turbulence is relevant because changes in customer needs, market demand, and service expectations may require firms to strengthen customer focus, continuous improvement, process management, and service adaptation. Therefore, market turbulence may shape the extent to which TQM practices contribute to financial performance, including market share, return on investment, and cost reduction. Market turbulence refers to the rate of change in the composition of customers and their preferences over time (Jaworski & Kohli, 1993). In the hotel industry, it may occur when customer needs, travel preferences, booking behavior, price sensitivity, and service expectations change rapidly. Market turbulence is relevant to TQM practices because hotels facing unstable customer demand need to strengthen customer focus, continuous improvement, employee involvement, process management, and quality data management to respond effectively to changing market conditions. It is also relevant to financial performance because rapid changes in customer demand may affect market share, return on investment, and operating costs. Therefore, market turbulence may shape the extent to which TQM practices contribute to hotels' financial performance.

Wang et al. (2012) provide direct evidence from the hotel industry by showing that external environmental factors, including market turbulence, moderate the relationships between TQM, market orientation, and hotel performance. This suggests that the financial benefits of TQM practices may vary depending on the level of market turbulence. Accordingly, this study examines market turbulence as a moderating factor in the relationship between TQM practices and financial performance in Vietnamese hotels.

Taken together, prior studies suggest that market turbulence is relevant to TQM because it changes how hotels understand and respond to customer needs. When customer preferences, booking behavior, price sensitivity, and service expectations change rapidly, TQM practices may become more important for maintaining service consistency and financial outcomes. However, little is known about how market turbulence affects the TQM–financial performance relationship in Vietnamese hotels, particularly regarding market share, return on investment, and operating costs. Therefore, this study examines market turbulence as a moderator of the relationship between TQM practices and hotels' financial performance.

Competitive intensity

Competitive intensity refers to the degree of rivalry among firms in the same market. In the hotel industry, intense competition may arise from price pressure, service differentiation, promotional activities, and customers' ability to switch among alternative accommodation providers. Competitive intensity is related to TQM practices because hotels facing stronger competition need to improve customer focus, service consistency, employee involvement, process management, and cost control. It is also related to financial performance because competition can affect market share, return on investment, and operating costs.

Prior studies suggest that competitive intensity may shape the effectiveness of TQM practices.

Chong & Rundus (2004) demonstrate from their research findings that implementing TQM practices within the realm of market competition can augment organizational performance. Wang et al. (2012) further showed that external environmental factors moderate the relationships among TQM, market orientation, and hotel performance. In the hotel sector, Patiar et al. (2012) found that TQM and market competition interact in influencing hotel departmental performance, although the effect on financial performance was indirect. However, findings remain mixed, as Abubakar et al. (2018), in their study, demonstrate that the impact of TQM implementation on SMEs' performance is largely contingent on the degree of competition.

Overall, the literature suggests that competitive intensity may affect both the implementation and financial value of TQM practices. In highly competitive hotel markets, TQM may help firms differentiate services, retain customers, improve service consistency, enhance process efficiency, control costs, and protect market share. However, empirical evidence on its moderating role remains mixed, especially in the Vietnamese hotel sector. Therefore, this study examines whether

competitive intensity moderates the relationship between TQM practices and financial performance, measured by market share, return on investment, and cost reduction.

Technological turbulence

Technological turbulence has attracted research attention as a moderator of management–performance relationships beyond TQM. Chávez et al. (2015) show that the effect of internal lean practices on organizational performance depends on the pace of technological change. In the TQM literature, Wang et al. (2012) find that technological turbulence moderates the relationship between TQM and hotel performance in China. Ndabako et al. (2019) propose that technological progress moderates the TQM–organizational performance relationship by helping firms exploit technological opportunities for competitive advantage, although their model remains empirically untested. Ahinful et al. (2023) similarly propose technological turbulence and competitive intensity as moderators between TQM practices and organizational innovation, but this model also requires empirical validation.

In hotels, technological turbulence may influence the TQM–financial performance relationship by changing the tools, systems, and processes used to manage service quality. Rapid technological change may require updates in reservation systems, customer feedback systems, service delivery, quality data, and internal coordination, thereby supporting responsiveness, process control, and operational efficiency. However, empirical evidence on whether technological turbulence strengthens the financial benefits of TQM in hotels remains limited, especially in emerging markets such as Vietnam.

Overall, prior studies on market turbulence, competitive intensity, and technological turbulence provide inconsistent evidence and often examine only one environmental factor. Therefore, this study incorporates all three factors into a single research model to clarify how external environmental conditions shape the relationship between TQM practices and hotels' financial performance. These arguments form the basis for the research model and hypotheses.

3 RESEARCH MODEL AND HYPOTHESIS

3.1 Theoretical foundations of the research model

3.1.1 Input - Process - Output framework (IPO)

The Input - Process - Output (IPO) framework provides a systems-based foundation for explaining how TQM practices influence hotel financial performance. This study uses IPO as an analytical lens to conceptualize TQM implementation as a transformation process rather than a separate theory of quality management. Inputs include organizational resources and quality-related conditions, such as top management commitment, employee involvement, customer requirements, and quality information. These inputs are transformed through TQM processes, including customer focus, continuous improvement, process management, and quality control, into outputs such as improved market share, higher return on investment, and reduced costs. Youssef (1996) applied this logic to TQM by illustrating relationships between the TQM system and organizational participants. In hotels, Wang et al. (2012) used the IPO framework to examine the relationship between TQM and market orientation, while emphasizing the role of superior capabilities and customer value in hotel survival and success. Chen et al. (2018) also considered TQM as an input and transformational leadership as a process for achieving sustainable competitive advantage. Overall, IPO-based studies view TQM as a key process that leads to desired business performance outputs.

3.1.2 Contingency theory

Contingency Theory argues that there is no single best way to manage an organization, because the effectiveness of managerial practices depends on operating conditions. Accordingly, performance is influenced by the fit between internal practices and contextual factors such as the external environment, technology, organizational size, and market conditions (Lawrence and Lorsch, 1967).

In this study, Contingency Theory provides the basis for examining whether external environmental factors moderate the relationship between TQM practices and hotels' financial performance. Although TQM practices can improve customer focus, employee involvement, continuous improvement, process management, and cost control, their financial benefits may vary with market turbulence, competitive intensity, and technological turbulence.

Specifically, market turbulence may require adaptation to changing customer preferences and demand; competitive intensity may increase the need for service differentiation, cost control, and process efficiency; and technological turbulence may require updates to service processes, quality data systems, and operational technologies. Therefore, these factors may shape how TQM practices contribute to market share, return on investment, and cost reduction.

3.2 Analytical framework

Through the application of foundational theories, this study is built upon the utilization of the IPO framework and contingency theory, as described below:

- The application of the IPO framework to TQM practice considers the level of TQM implementation and the moderating role of external factors on the relationship between TQM practices and hotels’ financial performance. Under this IPO-based framework, TQM practices represent the process component through which hotels transform organizational resources and quality management efforts into performance outcomes. External environmental factors are considered contextual conditions that may moderate the extent to which TQM practices contribute to financial performance. The output component is represented by hotels’ financial performance, measured through market share, increased return on investment, and reduced costs. Previous studies conducted by authors such as Youssef (1996), Wang et al. (2012), and Chen et al. (2018) have also confirmed the significance of adopting the IPO framework theory to enhance TQM practices and improve overall outputs for businesses.
- Adopting a contingency perspective, recent studies suggest that the effectiveness of TQM is context-dependent rather than universal. In particular, environmental uncertainty and market dynamism can shape (and sometimes strengthen or weaken) how TQM practices translate into employee outcomes and organizational performance; therefore, TQM implementation strategies should be tailored to external contextual conditions. (Yazdani, 2021; Manzani and Cegarra, 2023; Koomson, 2025).

From that, the authors propose the following research model:

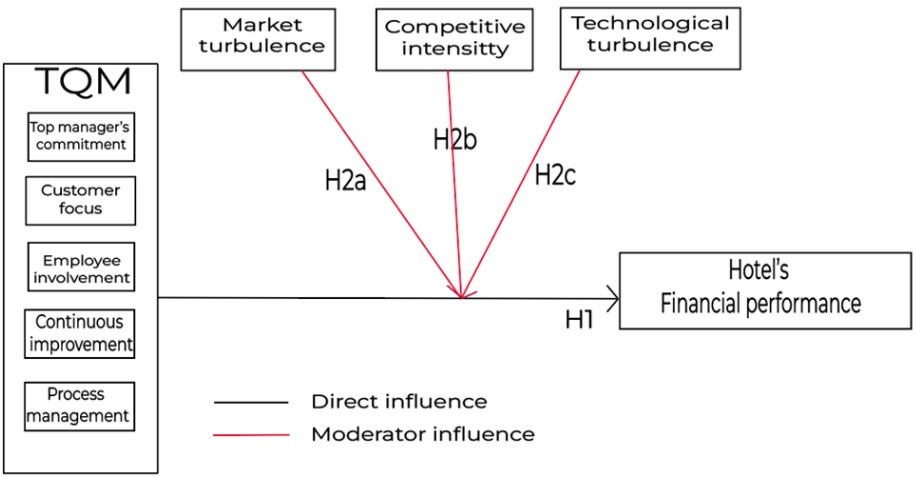


Figure 1 - Analytical framework

In this study, TQM practices are conceptualized as a multidimensional construct consisting of top management commitment, customer focus, employee involvement, continuous improvement, and process management.

Hotel financial performance is commonly assessed through various indicators, including revenue, profit, and return on investment (Sila, 2007; Cheng and Krumwiede, 2012; Wang et al., 2012). Additionally, other metrics such as increased market share and reduced costs are also considered as significant factors in evaluating financial performance (Moorman and Rust, 1999; Wang et al., 2012). This study aligns with the aforementioned research, utilizing a 5-point Likert scale to assess financial outcomes. The measured items encompass market share, increased return on investment, and reduced costs

Factors in the external environment encompass elements such as market turbulence, competitive intensity, and technological turbulence.

3.3 RESEARCH HYPOTHESIS

3.3.1 Relationship between TQM practices and hotels' financial performance

TQM practices can be viewed as organizational capabilities that improve service consistency, reduce errors, strengthen customer focus, enhance employee involvement, and increase process efficiency. From a resource-based perspective, these capabilities may lead to superior financial outcomes because they are embedded in organizational routines and difficult for competitors to imitate (Powell, 1995; Asad et al., 2020).

Prior studies show that effective TQM implementation is positively associated with financial performance. Firms with successful quality management implementation or quality awards often outperform comparable firms financially, while TQM as a strategic initiative has been linked to improved financial indicators (Hendricks and Singhal, 1997, 2001; York and Miree, 2004; Barker and Emery, 2006; Calvo-Mora et al., 2014; O'Neill et al., 2016).

In hotels, TQM may improve financial performance through both revenue-enhancing and cost-reducing mechanisms. People-oriented practices, including top management commitment, customer focus, and employee involvement, can improve customer value, service reliability, loyalty, market share, and sales. Meanwhile, process-oriented practices, including continuous improvement and process management, can reduce service failures, waste, rework, and operating costs. Prior hotel studies similarly suggest that TQM contributes to financial outcomes through improved processes, leadership commitment, customer focus, employee involvement, and operational efficiency (Claver-Cortés et al., 2006; Kumar et al., 2011; Wang et al., 2012; Amin et al., 2017).

Therefore, TQM practices are expected to improve hotels' financial performance, measured through market share, increased return on investment, and reduced costs. *H1: TQM practices have a positive effect on the financial performance of hotels in Vietnam.*

3.3.2 Moderator effects of external environmental factors on the relationship between TQM practices and financial performance of hotels

Drawing on Contingency Theory, this study argues that the financial impact of TQM practices may vary with hotels' external environment, because the effectiveness of managerial practices depends on firms' operating conditions. Market turbulence, competitive intensity, and technological turbulence are treated as moderators because they may affect the strength of the TQM-financial performance relationship, rather than explain the internal mechanism through which TQM influences performance (Luthans and Stewart, 1977; Miller, 1981; Wang et al., 2012).

Market turbulence may moderate this relationship because changes in customer preferences, customer composition, and market demand require hotels to adapt services quickly, while TQM practices support service consistency and responsiveness through customer focus, continuous improvement, employee involvement, and process management (Hult et al., 2004; Santos-Vijande and Álvarez-González, 2007; Wang et al., 2012).

Competitive intensity may also moderate this relationship because hotels face pressure to differentiate services, improve quality, control costs, and retain customers. TQM practices can reduce service failures, enhance process efficiency, and strengthen cost control, especially under higher competition (Chong and Rundus, 2004; Anderson et al., 1995; Kumar et al., 2011; Wang et al., 2012).

Technological turbulence may further affect this relationship because rapid technological change requires hotels to update service processes, information systems, reservation systems, customer feedback systems, and operational technologies. Combining TQM with technological adaptation may improve customer information collection, service delivery, and process efficiency, thereby supporting financial outcomes such as market share, return on investment, and cost reduction (Cao and Zhang, 2011; Zhang and Duan, 2010; Lin and Wu, 2014; Wang et al., 2012). So we have the following hypothesis:

- *H2a: The impact of TQM practices on performance within Vietnamese hotel firms is influenced by the presence of market turbulence as a moderating factor.*
- *H2b: The connection between TQM practices and performance among Vietnamese hotel firms is conditioned by the competitive intensity acting as a moderating variable.*
- *H2c: The effect of TQM practices on performance in Vietnamese hotel firms is moderated by the level of technological turbulence.*

4. RESEARCH METHODOLOGY

4.1 Sample

The study focuses on hotels rated three to five stars in Hanoi, Ho Chi Minh City, and Da Nang. Hotels below three stars were excluded from the sample because the study aims to examine TQM practices in hotels with relatively formalized service standards, managerial structures, and quality management activities. The final sample consisted of 185 valid responses from managers working in three-star, four-star, and five-star hotels. The distribution of the sample by hotel category is reported in Table 1.

Table 1 - Hotel profile

Hotel category	Number of valid responses	Percentage
Three-star hotels	116	62.7
Four-star hotels	50	27
Five-star hotels	19	10.3
Total	185	100

Specifically, the sample included 116 three-star hotels, 50 four-star hotels, and 19 five-star hotels, accounting for 62.7%, 27.0%, and 10.3% of the sample, respectively. This distribution reflects the study's focus on rated hotels while also acknowledging that higher-category hotels, particularly five-star hotels, are less numerous and more difficult to access. Since TQM practices and service infrastructure may differ across hotel categories, the hotel category was reported and considered when interpreting the findings.

The research subjects for understanding these practices will be managers of these hotels, holding positions such as General Director/Deputy General Director, Director/Deputy Director, or managers of departments designated by the General Director/Director (e.g., front desk manager, housekeeping department manager, restaurant department manager). These managers will be asked about the TQM practices implemented in their respective hotels and related issues.

Data will be collected through a survey conducted via a Google Form link, utilizing various approaches to reach out to respondents. The survey link will be sent to a senior manager of each hotel through different contact methods, such as email, Zalo, Messenger, or face-to-face communication. After conducting a preliminary check and cleaning the data, one response was rejected due to insufficient information. The unit of analysis was the hotel. One manager from each hotel was invited to complete the questionnaire. After data screening, 185 valid responses from 185 hotels were retained for analysis.

Given the difficulty of accessing hotel managers, this study employs non-probability sampling.

4.2 Assessment of Common method bias

Because the data were collected from a single survey instrument and hotel managers as key informants, common method bias was considered. Following Podsakoff et al. (2003), several procedural remedies were applied, including clear questionnaire wording, the use of measurement items adapted from prior studies, assurance of academic research purposes, and separation of background information from the main measurement items.

Harman's single-factor test was also conducted using unrotated exploratory factor analysis. The results showed that no single factor emerged, and the first factor explained only 24.214% of the total variance, below the commonly used 50% threshold. Thus, common method bias is unlikely to seriously affect the validity of the findings.

4.3 Measures

The authors developed a questionnaire using a scale approach. The TQM practice scale comprises five sub-scales: Customer focus, manager commitment, employee engagement, continuous improvement, and process management, encompassing a total of 26 questions. Additionally, the scale for external environmental factors is composed of three sub-scales: Market turbulence, competitive intensity, and technological turbulence, involving a total of 11 items. Finally, the hotels' financial performance scale evaluates financial outcomes and consists of three questions.

The questionnaire consists of two main parts: Part 1 collected respondent profile and hotel background information, including the respondent's managerial position, hotel category, hotel location, and other general information about the hotel. This information was used to confirm that the respondents were appropriate key informants with sufficient knowledge of TQM practices in their hotels. Part 2 includes questions about the evaluation of TQM practices, external environmental factors, and the evaluation of hotel business performance. Managers rate the quality of the scales based on a 5-point Likert scale (1: Totally disagree; 2: Disagree; 3: No opinion; 4: Agree; 5: Totally agree).

Data processing and analysis were conducted using SPSS 26 and AMOS 23 software.

4.4 Testing measurement scales

To check the reliability of the scales for TQM practices, external environmental factors, and hotel business performance, the authors conducted test: Cronbach's Alpha reliability test. Appendix 1 indicates that the scales utilized in the study exhibit good reliability, with all Cronbach's alpha values exceeding 0.7.

Because the measurement model was theory-driven and the scales were adapted from prior studies, CFA was used as the main procedure for validating the final measurement model. Therefore, EFA results are not reported as part of the final measurement validation.

After conducting reliability testing using Cronbach's Alpha coefficient method, the observed variables that meet the established criteria will be included in CFA using AMOS 23 software. This step aims to assess the scales' suitability as well as the contribution of the observed variables to the overall model.

In the CFA analysis, various fit indices such as Chi-squared indices, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) will be employed to evaluate the goodness-of-fit of the measurement model.

The measurement model was refined through a scale purification process based on item content, factor loadings, squared multiple correlations, standardized residuals, and modification indices. This approach allows for refining the model and enhancing its alignment with the data.

Before conducting CFA and SEM, normality was assessed in AMOS. Skewness values ranged from -0.970 to 0.162 and kurtosis values from -1.269 to 1.872, indicating no serious violation of univariate normality. However, multivariate normality was not supported, with multivariate kurtosis of 211.800 and a critical ratio of 28.303. Therefore, Maximum Likelihood estimation was supplemented with 5,000 bootstrap resamples to obtain more robust standard errors and confidence intervals.

The Bollen–Stine bootstrap test suggested that exact model fit should be interpreted cautiously; thus, multiple fit indices were used. The CFA results indicated acceptable model fit: $\chi^2/df = 1.868$, IFI = 0.915, CFI = 0.914, TLI = 0.901, and RMSEA = 0.069. Although some indices were slightly below common thresholds, the model was retained because it was theoretically grounded, used items adapted from prior studies, and had statistically significant factor loadings.

The outcomes of the CFA analysis are presented in Table 2. The purpose of this analysis is to assess the fit of the measurement model before testing the structural relationships among the research constructs.

Table 2 - CFA model fit indices for the measurement model

Condition (Hair et al., 2010)		CFA result	
		Result	Assessment
1	≤ 0.08 desirable;	RMSEA = 0.069	Acceptable
2	≥ 0.90	CFI = 0.914	Acceptable
3	≥ 0.90	TLI = 0.901	Acceptable
4	CMIN/df < 3; good	Cmin/df = 1.868	Acceptable

(GFI was not used as a primary fit criterion because previous methodological studies have shown that GFI is sensitive to sample size, degrees of freedom, and model complexity, and its use has been discouraged in recent SEM guidelines (Hooper et al., 2008))

Table 2 reports the fit indices for the refined CFA measurement model. Before final estimation, the scales were purified based on item content, standardized factor loadings, squared multiple correlations, standardized residuals, and modification indices. Items were removed only when they showed weak empirical performance or caused local misfit without changing the theoretical meaning of the construct. Accordingly, Process management1, Process management3,

Process management⁵, Customer focus⁶, Customer focus⁵, and Hotels' financial performance² were excluded.

The refined CFA model showed acceptable fit: CMIN/df = 1.868, RMSEA = 0.069, CFI = 0.914, and TLI = 0.901, meeting commonly recommended thresholds. Therefore, the model was considered adequate for subsequent reliability, validity, and structural hypothesis testing. Subsequently, the authors assessed the reliability, convergence, and discriminability of the scale structures using the CR (Composite Reliability), AVE (Average Variance Extracted), and MSV (Maximum Shared Variance) indices. The results obtained are displayed in Table 3:

Table 3 - Composite reliability, convergent validity, and discriminant validity of the measurement scales

Constructs	Composite Reliability	AVE	MSV
<i>Total quality management</i>			
Customer focus (CF)	0.874	0.636	0.330
Top management commitment (TM)	0.920	0.659	0.330
Employee's involvement (EI)	0.970	0.868	0.565
Continuous improvement (CI)	0.805	0.585	0.280
Process management (PM)	0.944	0.850	0.565
<i>Hotels' financial performance (HO_FP)</i>			
	0.767	0.526	0.491
<i>External environment</i>			
Market turbulence (MA_TU)	0.908	0.713	0.091
Competitive intensity (CO_IN)	0.825	0.541	0.269
Technological turbulence (TE_TU)	0.836	0.633	0.189

After the CFA-based scale purification, the reliability and validity of the retained measurement scales were assessed using CR, AVE, and MSV. The findings indicate that all scales have a CR index greater than 0.7, ensuring convergence. The AVE index for the scales Top manager's commitment, Employee's involvement, Continuous improvement, Process management, Customer focus, Hotels' financial performance, Market turbulence, Competitive intensity, and Technological turbulence are all greater than 0.5, confirming their convergence. The MSV index for the scales is smaller than the AVE index, ensuring discrimination of the scales.

The outcomes of the scale testing demonstrate that the initial scale is satisfactory, thereby allowing the authors to proceed with the subsequent analysis.

5 RESULTS

Tables 4, 5 and figure 2, 3 present the results of the SEM (Structural Equation Model) analysis conducted in Amos. Table 4 and figure 2 examine hypothesis H1, while Table 5 and figure 3 evaluate hypothesis H2.

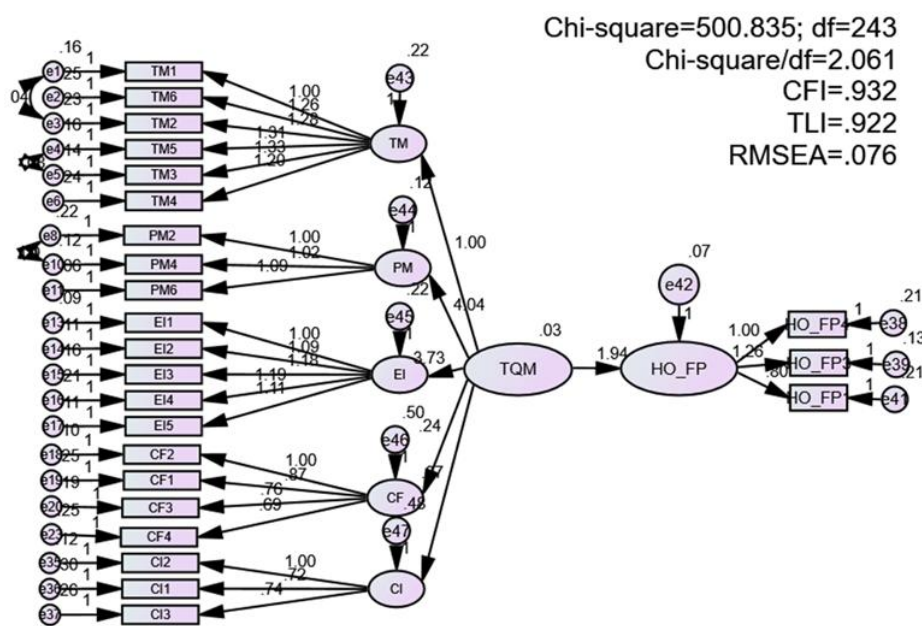


Figure 2 - SEM model - testing hypothesis H1

Table 4 - The result of hypothesis testing – H1

Relationships		Standardized Regression Weights		P	Conclude
Hotels' financial performance	<---	TQM	0.795	0.0001	Accepted hypothesis H1

Table 4 provides evidence that TQM practice has a significant impact on the financial performance of hotels, with an impact coefficient of 0.795 and a p-value of 0.0001, which is less than 0.05. Therefore, hypothesis H1 is accepted, indicating that TQM practice has a positive effect on the financial performance of Vietnamese hotel firms.

In order to manage the moderator variable in AMOS software, the authors will employ the MMR moderator regression model (Saunders, 1956). Accordingly, the following variables: Total quality management * Market turbulence; Total quality management * Competitive intensity; Total quality management * Technological turbulence, will be included in the model as predictor variables to assess their impact on hotels' financial performance. If these variables, namely Total quality management * Market turbulence; Total quality management * Competitive intensity; Total quality management * Technological turbulence, affect the dependent variable (when the p-value of these variables is less than 0.05), it implies that the practice of TQM in terms of considering the influence of external environmental factors, such as Market turbulence, Competitive intensity, and Technological turbulence, has an effect on business performance. This indicates that external environmental factors, including Market turbulence, Competitive intensity, and Technological turbulence, moderate the relationship between TQM practices and business outcomes. However, the product of Total quality management * Market turbulence; Total quality management * Competitive intensity; Total quality management * Technological turbulence may lead to multicollinearity issues with TQM practice or Market turbulence, Competitive intensity, Technological turbulence. Therefore, these variables need to be standardized before calculating the product. Table 5 presents the results of the regression model analysis of Market turbulence, Competitive intensity, and Technological turbulence using AMOS software after normalizing the variables.

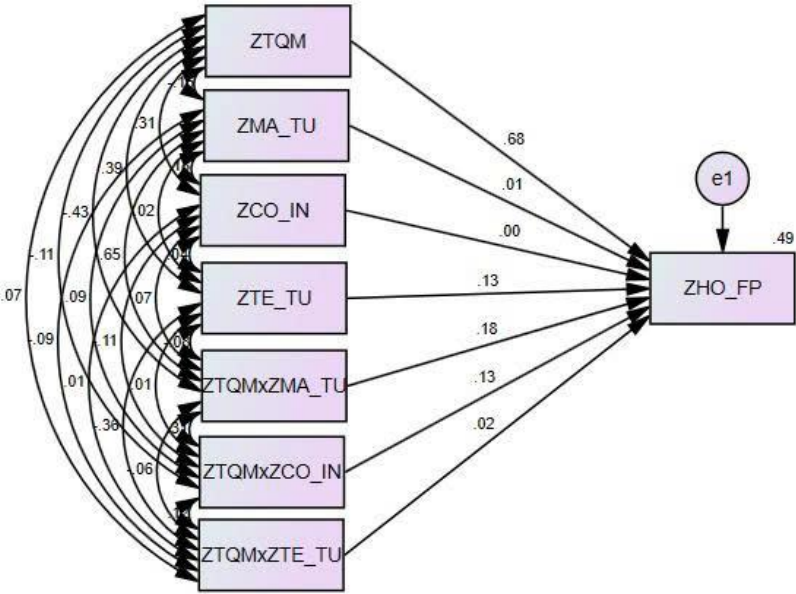


Figure 3 - SEM model - testing hypothesis H2

The results of the path analysis reveal a statistically significant relationship between Total quality management * Market turbulence and Total quality management * Competitive intensity on the hotels' financial performance. This is evidenced by p-values of 0.033 and 0.028, both of which are less than the threshold of 0.05. Consequently, Market turbulence and Competitive intensity play a role in moderating the impact of TQM practice on the hotels' financial performance. This supports the acceptance of Hypotheses H2a and H2b. The regression coefficients for the two moderating variables, Market turbulence and Competitive intensity, are 0.177 and 0.127, respectively, both exhibiting positive signs. This signifies that an increase in awareness regarding the influence of Market turbulence and Competitive intensity results in a corresponding increase in the impact of TQM practice on the hotels' financial performance.

However, the relationship between Total quality management * Technological turbulence and the hotels' financial performance is not statistically significant, with a p-value of 0.794, exceeding the threshold of 0.05. Consequently, technological turbulence does not play a role in moderating the impact of TQM practices on the hotels' financial performance. This leads to the rejection of Hypothesis H2c.

Table 5 - The result of hypothesis testing – H2

Relationships			Standardized Regression Weights	P	Conclude
Hotels' financial performance	<--	Total quality management	0.678	0.0001	
Hotels' financial performance	<--	Total quality management * Market turbulence	0.177	0.033	Accepted hypothesis H2a
Hotels' financial performance	<--	Total quality management * Competitive intensity	0.127	0.028	Accepted hypothesis H2b
Hotels' financial performance	<--	Total quality management * Technological turbulence	0.016	0.794	Rejected hypothesis H2c

6 DISCUSSION

Firstly, the findings of the study indicate that TQM practices have a significant positive impact on the financial performance of hotels, with a standardized regression weights of 0.795. This suggests that hotels that adhere to TQM principles and practices are likely to achieve better

financial performance. The study also highlights the importance of top management commitment, customer focus, employee engagement, and process management in driving financial performance. These conclusions align with previous studies by Wang et al. (2012), Bouranta et al. (2017), Albuhihi and Abdallah (2018) and ElShaer and Shaker (2020), which found positive relationships between TQM practices and financial performance in hotel businesses. Given the challenges faced by hotels in Vietnam due to the COVID-19 pandemic and the ongoing recovery process, improving financial performance becomes even more crucial. To achieve this, hotels must prioritize providing high-quality services that satisfy customers, encouraging customer loyalty and generate word-of-mouth referrals. Implementing TQM principles can improve service quality and customer satisfaction through senior management commitment, employee involvement, customer focus, and effective process management. Properly managing the service delivery, analyzing performance data, and continuously improving processes can lead to higher revenue, competitive advantage and long-term sustainability in the hospitality industry.

Secondly, the study reveals that managers' awareness of external environmental conditions (market turbulence and competitive intensity) plays a moderating role in the relationship between TQM practices and the hotels' financial performance. This finding is consistent with previous research by Tari et al. (2010), Wang et al. (2012), Abubakar et al. (2018), Suksri et al. (2019) and Veselinović et al. (2021). The results suggest that when hotel managers are conscious of market turbulence and competition intensity, they are more likely to adapt their quality activities to meet customer needs and provide superior services. This awareness strengthens management commitment to quality, promotes employee involvement, and supports effective process management. As a result, hotels become better equipped to handle environmental changes, navigate competition, and achieve better financial performance. Overall, managers' awareness of environmental conditions helps hotels shape quality initiatives, foster a customer-centric culture, and improve their competitive position in the market.

Thirdly, this study did not find a significant moderating effect of technological turbulence on the relationship between TQM practices and hotel financial performance. Although Industry 4.0's technologies have been widely integrated into global business operations, Vietnam's hotel industry remains in the early stages of adoption. The survey data was collected in 2022, when hotels were just resuming operations after the Covid-19 pandemic and still faced difficulties in stabilizing operations, especially personnel shortages. Hotel managers may have been either indifferent to technological development or interest but lacking knowledge of implementation strategies. In three-star hotels, technology implementation has been gradual and awareness of how technological advancements affect management activities remains relatively low. Therefore, the findings do not indicate a moderating impact of technological turbulence. This is similar to Chavez et al. (2015), who found no conclusive evidence of its moderating influence on organizational performance.

7 CONCLUSIONS AND IMPLICATIONS

The research findings of this study demonstrate the favorable influence of TQM practices on the financial performance of hotels in Vietnam. Moreover, the level of awareness among hotel managers regarding the impact of external environmental factors (market turbulence and competitive intensity) can potentially shape the association between TQM practices and the hotels' financial outcomes. However, technological turbulence does not significantly moderate this relationship. In other words, technological change alone may not automatically strengthen the financial benefits of TQM unless hotels are able to integrate technology effectively into their quality management processes. Consequently, the study offers crucial recommendations for hotel managers in Vietnam.

7.1 Theoretical contributions

This study offers several theoretical contributions. First, it advances TQM and hospitality management literature by focusing on hotels' financial performance, clarifying the financial value of TQM through market share, return on investment, and cost reduction. Second, it extends the contingency perspective by showing that the TQM-financial performance relationship varies across environmental conditions, as market turbulence and competitive intensity significantly moderate this relationship. Third, the non-significant moderating effect of technological turbulence is theoretically meaningful, suggesting that technology does not automatically strengthen or weaken the financial impact of TQM; its value may depend on hotels' technological capability and integration into quality management. Finally, evidence from Vietnamese hotels extends TQM research to an emerging-market context.

7.2 Managerial implications

The findings indicate that hotel managers should use TQM as a strategic tool to improve financial performance by strengthening top management commitment, customer focus, employee involvement, continuous improvement, and process management. Managers should adapt TQM practices to external conditions by monitoring customer preferences in turbulent markets and using TQM to support service quality differentiation, process efficiency, and cost control under intense competition. Although technological turbulence does not significantly moderate the TQM–financial performance relationship, technology should still be integrated into customer feedback systems, service process management, and quality data analysis. These implications are relevant for hotels in emerging economies, where dynamic markets and limited resources require flexible TQM implementation.

7.3 Limitations and future research

Besides the obtained results, this study still has some limitations. First, the study's findings may vary over time and suggests conducting future research using a longitudinal approach to track TQM adoption and its long-term effects on hotels' financial performance. Second, this study focuses on hotels' financial performance, measured through perceived financial and market-related outcomes. Future research could extend the performance assessment beyond financial indicators by incorporating non-financial outcomes such as customer satisfaction, employee satisfaction, service quality, customer loyalty, and innovation performance. Such an extension would provide a more comprehensive understanding of how TQM practices contribute to overall hotel performance. Third, although the observed variables did not seriously violate univariate normality, the data did not satisfy multivariate normality. To reduce the potential influence of non-normality, bootstrap procedures were applied in AMOS.

By addressing these limitations, future research can provide a more comprehensive understanding of how TQM practices influence hotel success and contribute to the industry's sustainability and growth.

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Appendix 1: The results of reliability test

Constructs	Items	Cronbach's Alpha
<i>Total quality management</i>		
Customer focus	4	0.896
Top management commitment	6	0.923
Employee's involvement	5	0.968
Continuous improvement	3	0.800
Process management	3	0.941
<i>Hotels' financial performance</i>	3	0.765
<i>External environment</i>		
Market turbulence	4	0.913
Competitive intensity	4	0.824
Technological turbulence	3	0.826