
Adoption of Total Quality Management and Quality Certification in the Portuguese Services Sector

Marina Antunes¹  | Pedro Mucharreira^{2*}  | Maria do Rosario Texeira Justino³  | Joaquin Texeira-Quiros⁴ 

¹Lisbon Accounting and Business School, Polytechnic University of Lisbon, Portugal | CICEF – Research Center on Accounting and Taxation, School of Management, Polytechnic University of Cavado and Ave (IPCA), 4750-810 Barcelos, Portugal

²ISCE, Higher Institute of Lisbon and Tagus Valley, Portugal

³Lisbon Accounting and Business School, Polytechnic University of Lisbon, Portugal

⁴Autonomous University of Lisbon, Portugal

*Correspondence to: Pedro Ribeiro Mucharreira, ISCE, Higher Institute of Lisbon and Tagus Valley, Portugal.

E-mail: pedro.mucharreira@isce.pt

Abstract: The service sector presents a particularly challenging context for quality management and certification initiatives because of the predominance of intangible outputs and the difficulty of measuring service quality. In this environment, the effective management of business processes is not only a prerequisite for operational excellence but also a critical determinant of organizational competitiveness, long-term viability, and sustainable development. This study examines the relationships between Total Quality Management (TQM) practices and quality certification in service organizations. To address these objectives, Structural Equation Modeling (SEM) was used to evaluate the causal relationships among the latent constructs included in the conceptual framework. The results demonstrate that the implementation of TQM practices in Portuguese service firms contributes positively to operational and market-related performance outcomes. However, no statistically significant relationship was identified between TQM implementation and financial performance. With regard to ISO 9000 certification, the findings indicate that certified organizations do not achieve significantly higher levels of financial, operational, or market performance than non-certified firms. Overall, the evidence suggests that the performance benefits observed in the service sector are primarily associated with the adoption of comprehensive quality management practices rather than with certification itself, highlighting the importance of embedding quality principles in organizational processes beyond formal compliance requirements.

Keywords: ISO 9000, organizational performance, financial performance, market performance, quality certification, total quality management.

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INTRODUCTION

The service sector has experienced sustained growth over recent decades, becoming a fundamental component of modern economies and a key driver of value creation, employment, and competitiveness. The increasing complexity of global markets, coupled with heightened customer expectations and intensified



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competition, has stimulated growing academic and managerial interest in identifying the determinants of organizational effectiveness and continuous improvement within service organizations.

In this context, quality management has emerged as a strategic mechanism for enhancing organizational capabilities and achieving superior performance outcomes. Given the intangible nature of services and the challenges associated with assessing service quality, the implementation of quality management systems assumes particular relevance in service environments. Consequently, organizations operating in this sector increasingly seek to adopt managerial practices that facilitate process optimization, customer satisfaction, operational efficiency, and long-term competitiveness. Such practices enable firms to respond effectively to dynamic market conditions while fostering a culture of continuous improvement (Hananta & Susyanti, 2024; Salaheldin, 2009; Saunila, Ukko, & Jääskeläinen, 2024).

Among the various approaches to quality management, Total Quality Management (TQM) has been widely recognized as a comprehensive managerial philosophy aimed at improving organizational performance through the systematic involvement of all organizational members and the continuous enhancement of processes, products, and services. Previous research has sought to identify the critical TQM practices that contribute to organizational excellence, particularly within service settings (Kaynak, 2003). These practices commonly include top management commitment, continuous improvement and innovation, customer focus, employee involvement, teamwork, workforce training and development, and benchmarking activities (Antunes, Mucharreira, Justino, & Quirós, 2025).

Another central construct examined in this study is organizational performance. Despite its extensive use in management research, organizational performance remains a multidimensional and conceptually complex phenomenon, lacking a universally accepted definition or measurement framework. The diversity of perspectives adopted in the literature has contributed to significant variation in the criteria used to evaluate organizational outcomes, thereby complicating comparisons across studies. According to Harbour (2008) organizational performance can be assessed through a set of indicators that reflect the results generated by organizational activities. Similarly, Peterson, Gijsbers, and Wilks (2003) define organizational performance as an organization's ability to utilize its resources efficiently and effectively in achieving its strategic objectives. To address the multidimensional nature of this construct, the present study adopts three complementary performance dimensions: Financial performance, operational performance, and market performance.

Against this backdrop, the primary objective of this research is to examine the relationships between the implementation of TQM practices and quality certification within Portuguese service firms. Furthermore, the study seeks to evaluate the effects of both TQM implementation and ISO 9000 certification on organizational performance across its financial, operational, and market dimensions. By doing so, this research contributes to a deeper understanding of the role of quality management initiatives in enhancing organizational outcomes within the service sector.

THEORETICAL FRAMEWORK

The Relationship between TQM and Organizational Performance

TQM is widely recognized as a holistic management philosophy that promotes continuous improvement throughout the organization by integrating managerial commitment, employee involvement, customer orientation, and collaborative relationships with suppliers. Its primary objective is to enhance the quality of products, services, and organizational processes in order to meet or exceed customer expectations while fostering sustainable organizational success (García-Fernández, Claver-Cortés, & Tarí, 2022). As an evolving approach to quality management, TQM has significantly influenced the development of contemporary management practices by emphasizing systematic process improvement, organizational learning, and a culture of excellence. In this regard, TQM can be conceptualized as a set of managerial principles, techniques, and procedures designed to improve organizational effectiveness, operational reliability, and service quality. According to Vuppalapati, Ahire, and Gupta (1995) TQM constitutes a management philosophy centered on the continuous enhancement of products and processes, with customer satisfaction representing its ultimate objective (Antunes, Mucharreira, Justino, & Quirós, 2018; Hananta & Susyanti, 2024).

The relationship between TQM implementation and organizational performance has attracted considerable attention within the quality management literature. Numerous empirical studies have investigated the extent to which the adoption of TQM practices contributes to improved organizational outcomes across different industrial and service contexts (Anifowose, Ghasemi, & Olaleye, 2022; Brah & Lim, 2006; Brah, Tee, & Madhu Rao, 2002). The prevailing evidence suggests that organizations embracing TQM principles tend to achieve superior performance and enhanced competitive positioning. Specifically, several studies have reported that TQM implementation contributes to the development of sustainable competitive advantages through improvements in efficiency, service quality, customer satisfaction, and overall organizational effectiveness (Antunes et al., 2018; Chaher & Lakhal, 2025; Ebrahimi & Sadeghi, 2013; Terziovski & Samson, 1999). Furthermore, previous research has demonstrated that the successful implementation of TQM practices is associated with higher levels of quality performance, which subsequently translate into broader organizational benefits and improved business outcomes (Anifowose et al., 2022; Beck & Walgenbach, 2009; Prajogo & Sohal, 2003, 2004; Terziovski & Samson, 1999). These findings reinforce the view that quality management initiatives can generate value not only through process enhancement but also through their indirect effects on organizational competitiveness and long-term performance.

Despite the extensive body of literature examining the relationship between TQM and organizational performance, the assessment of performance outcomes remains a complex issue due to the multidimensional nature of the construct. Existing studies have adopted different conceptualizations and measurement approaches, resulting in considerable variation in the dimensions analyzed. For instance, some authors have focused exclusively on operational performance indicators (Terziovski & Samson, 1999), whereas others have examined the financial consequences of quality management initiatives (Hendricks & Singhal, 2001; York & Miree, 2004). Kaynak (2003) proposed and empirically validated a multidimensional framework encompassing financial and market performance, quality performance, and inventory management performance. Similarly, Calvo-Mora, Picón, Ruiz, and Cauzo (2013) argued that the effects of TQM should be evaluated through quality outcomes, operational outcomes, and economic-financial outcomes.

Within the specific context of service organizations, prior research has predominantly examined the influence of TQM on financial and operational performance dimensions (Brah, Li Wong, & Madhu Rao, 2000; Broday, 2022; Chaher & Lakhal, 2025; Kaynak, 2003; Saunila et al., 2024). In addition, several studies have emphasized the importance of customer-related outcomes, particularly customer satisfaction, as a critical indicator of organizational success in service environments characterized by high levels of customer interaction and service customization (Brah et al., 2002; García-Fernández et al., 2022; Sit, Ooi, Lin, & Chong, 2009).

Drawing upon the theoretical foundations presented above and considering the empirical evidence reported in previous studies, this research examines the impact of TQM practices on organizational performance within Portuguese service firms. Accordingly, the following hypotheses are proposed.

H₁: The implementation of TQM practices positively influences the financial performance of service firms.

H₂: The implementation of TQM practices positively influences the operational performance of service firms.

H₃: The implementation of TQM practices positively influences the market performance of service firms.

The Relationship between TQM and Quality Certification

The ISO 9000 family of standards constitutes one of the most widely recognized international frameworks for the implementation and assessment of quality management systems. These standards establish a set of principles and requirements designed to ensure the consistent delivery of products and services that meet customer expectations while promoting process standardization, organizational effectiveness, and continuous improvement. By providing a structured approach to quality management, ISO 9000 has become a globally accepted reference model adopted by organizations across a wide range of industries and sectors.

Beyond its role as a certification framework, ISO 9000 can also function as a catalyst for organizational change and process improvement. Organizations that approach certification as a strategic initiative rather than merely a compliance requirement are more likely to derive substantial benefits from the implementation process. In such cases, certification contributes to the formalization of procedures, the enhancement of operational controls, and the development of a culture focused on quality improvement. Consequently, the

implementation of ISO 9000 may facilitate the transition toward more comprehensive quality management practices and support the broader adoption of TQM principles (Broday, 2022).

The literature suggests that quality certification should not be viewed solely as an external validation mechanism but also as an instrument capable of strengthening internal management practices. According to Cândido, Coelho, and Peixinho (2021) the certification process promotes a more systematic and structured approach to organizational management, contributing to the development of management systems that support operational consistency and continuous improvement. From this perspective, ISO 9000 certification represents not merely a formal recognition of compliance with predefined standards but also an important step in the maturation of organizational quality management systems.

Furthermore, the successful attainment of ISO 9000 certification generally requires the implementation of several managerial practices that are closely aligned with the fundamental principles of TQM. Elements such as top management commitment, customer orientation, employee participation, process management, continuous improvement, and evidence-based decision-making constitute essential components of both quality certification and TQM frameworks. Consequently, organizations that demonstrate a high degree of TQM implementation are expected to possess the organizational capabilities and quality management infrastructure necessary to satisfy certification requirements. Based on these theoretical considerations, it can be argued that the adoption of TQM practices creates a favorable organizational environment for the successful implementation and maintenance of quality management systems, thereby increasing the likelihood of obtaining quality certification. Accordingly, the following hypothesis is proposed.

H₄: The implementation of TQM practices positively influences the attainment of quality certification in service firms.

Quality Certification and Its Impact on Organizational Performance

The service sector has become an increasingly important contributor to economic growth, employment generation, and value creation worldwide, reinforcing its strategic relevance within contemporary business environments (Cândido et al., 2021). The growing complexity of service markets, coupled with rising customer expectations and intensified competition, has increased the need for organizations to adopt effective management systems capable of ensuring consistent service quality and operational excellence. Within this context, internationally recognized quality management standards, particularly those associated with the ISO 9000 family, have emerged as important mechanisms for improving organizational processes and strengthening competitive capabilities (Alshahrani & Husain, 2024).

The ISO 9000 standards provide a structured framework for the implementation, monitoring, and continuous improvement of quality management systems. Their applicability extends across organizations of different sizes, ownership structures, and sectors of activity, including manufacturing, commerce, and services (Saunila et al., 2024; Walker & Johnson, 2009). Although the initial diffusion of ISO 9000 certification was largely concentrated within industrial organizations, service firms have increasingly embraced certification as a strategic instrument for improving service quality, enhancing process consistency, and responding to stakeholder expectations (Chaher & Lakhal, 2025; Rönnbäck & Witell, 2008).

Despite the widespread adoption of ISO 9000 standards, the extent to which certification contributes to improved organizational performance remains a subject of considerable debate. A substantial body of research has reported positive associations between quality certification and organizational outcomes, particularly in terms of financial performance. Empirical evidence suggests that certified organizations may benefit from increased operational efficiency, improved resource utilization, enhanced customer confidence, and stronger market positioning, which can ultimately translate into superior financial results (Kim, Kumar, & Kumar, 2011; Psomas, Pantouvakis, & Kafetzopoulos, 2013; Wu & Liu, 2010).

However, the literature also reveals contrasting findings. Several studies have failed to identify significant performance improvements attributable to ISO 9000 certification, suggesting that certification alone may not be sufficient to generate sustainable competitive advantages or superior organizational outcomes (Heras-Saizarbitoria, Arana, & Cilleruelo, 2013; Parast & Fini, 2010; Prajogo & Brown, 2006; Rönnbäck & Witell, 2008; Su, Li, Zhang, Liu, & Dang, 2008). Moreover, some investigations have reported negative relationships between

certification and financial performance, arguing that the costs associated with implementation and maintenance may outweigh the benefits under certain organizational conditions (Aarts & Vos, 2001; Yeung, Lo, & Cheng, 2011). Similarly, Martínez-Costa, Choi, Martínez, and Martínez-Lorente (2009) concluded that ISO 9000 certification does not exert a significant influence on financial performance, while other studies have produced mixed or inconclusive results regarding its effectiveness (Saunila et al., 2024; Terziovski & Power, 2007). These divergent findings suggest that the relationship between quality certification and organizational performance remains far from settled, particularly within the service sector, where the characteristics of service delivery and customer interaction may influence the effectiveness of quality management systems. Consequently, further empirical investigation is required to clarify the extent to which certification contributes to different dimensions of organizational performance. In light of these considerations, the present study examines the effects of ISO 9000 certification on financial, operational, and market performance among Portuguese service firms. Accordingly, the following hypotheses are proposed.

H₅: ISO 9000 certification positively influences the financial performance of service firms.

H₆: ISO 9000 certification positively influences the operational performance of service firms.

H₇: ISO 9000 certification positively influences the market performance of service firms.

Conceptual Model

Building upon the theoretical foundations discussed in the preceding sections, the proposed conceptual framework assumes that TQM practices contribute to organizational performance through both direct and indirect mechanisms. Direct effects arise from the influence of TQM on organizational processes, employee involvement, customer satisfaction, and continuous improvement initiatives. Indirect effects emerge through the facilitation of quality certification, which may further strengthen organizational legitimacy, process standardization, and quality assurance mechanisms.

Within the proposed model, TQM is conceptualized as a multidimensional managerial philosophy that promotes continuous improvement and organizational excellence, while ISO 9000 certification is considered an institutionalized quality mechanism reflecting the formal implementation of quality management principles. Organizational performance is treated as a multidimensional construct encompassing three complementary dimensions: financial performance, operational performance, and market performance.

Accordingly, the conceptual model proposes that TQM practices positively influence organizational performance and simultaneously increase the likelihood of achieving ISO 9000 certification. Furthermore, quality certification is expected to exert a positive effect on organizational performance across its financial, operational, and market dimensions. The hypothesized relationships are illustrated in Figure 1.

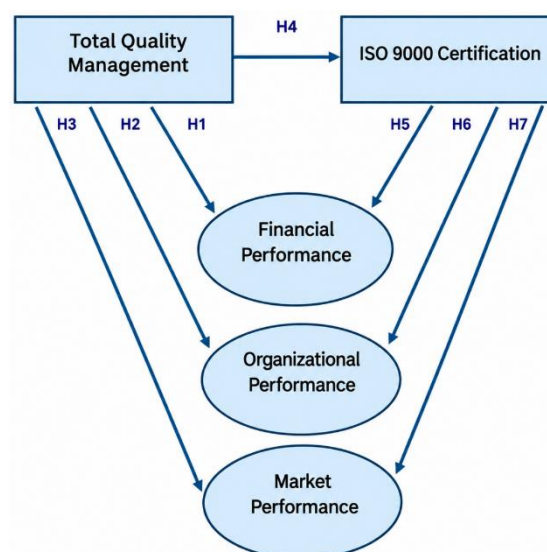


Figure 1: Conceptual model and research hypotheses

METHODOLOGY

The empirical data used in this study were extracted from the SABI database, which provides standardized financial and organizational information on firms operating in the Iberian market. The target population comprised Portuguese small and medium-sized enterprises (SMEs), selected in accordance with the official criteria defined in Portuguese legislation. Inclusion criteria required firms to present complete accounting information and to have a valid email contact, enabling direct survey distribution.

From an initial database screening, a total of 946 firms met the defined eligibility criteria and were invited to participate in the study. The survey process yielded 287 completed questionnaires, corresponding to an overall response rate of approximately 30.3%. After data screening, 143 valid responses were identified as belonging to service-sector firms, which constitute the final sample analyzed in this research. These firms represent a heterogeneous set of service activities, thereby providing a broad empirical basis for analysis.

Data collection was conducted through a structured online questionnaire administered via email invitation. The instrument was designed with closed-ended items to ensure measurement standardization and facilitate quantitative analysis. Responses were recorded using five-point Likert-type scales. Specifically, items measuring TQM practices were assessed on a scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), capturing the degree of implementation of quality management practices. In contrast, organizational performance indicators covering financial, operational, and market dimensions were evaluated using a scale ranging from 1 (“extremely unsatisfactory”) to 5 (“extremely satisfactory”), reflecting perceived performance levels.

In addition, nominal and ordinal variables were included to characterize both firms and respondents, enabling a comprehensive description of the sample. Quality certification status (ISO 9000) was operationalized as a dichotomous variable (0 = non-certified; 1 = certified), allowing for its inclusion in subsequent inferential analyses and structural equation modeling procedures.

Statistical Analysis

The statistical analysis was conducted using Structural Equation Modeling (SEM) to examine the relationships between the latent construct of TQM and the three dimensions of organizational performance: financial performance (FP), operational performance (OP), and market performance (MP). This multivariate technique was selected due to its suitability for simultaneously estimating multiple dependence relationships and for assessing complex theoretical models involving latent variables.

Prior to the estimation of the structural model, an analysis of the intercorrelations among the observed indicators associated with the TQM construct was performed. The results indicate that the correlations among TQM dimensions vary from moderate to high magnitudes. The lowest observed correlation was 0.447, corresponding to the relationship between variables B and LMC, while the highest correlation reached 0.853, observed between CI and DAMR. All correlation coefficients were statistically significant, thereby indicating a consistent association pattern among the indicators included in the TQM measurement model (Table 1).

Table 1: TQM Correlations

Dimensions	LMC	FC	B	IEE	DET	QCPD	DAMR	CI
LMC	1							
FC	0.644**	1						
B	0.447**	0.467**	1					
IEE	0.648**	0.612**	0.585**	1				
DET	0.736**	0.641**	0.476**	0.713**	1			
QCPD	0.745**	0.583**	0.497**	0.716**	0.747**	1		
DAMR	0.721**	0.775**	0.489**	0.762**	0.790**	0.775**	1	
CI	0.741**	0.735**	0.557**	0.703**	0.740**	0.805**	0.853**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed)

Research Hypotheses H₁, H₂, and H₃

Following the specification of the measurement model and the refinement of the observed indicators associated with each dimension of the TQM construct, the structural sub model was subsequently defined. At this stage, several modifications were introduced into the structural equation model in order to improve overall model fit and ensure adequate representation of the underlying theoretical framework.

The final structural model (Figure 2) reports standardized path coefficients along with their respective levels of statistical significance. In this specification, TQM is modeled as a second-order latent construct, reflecting its multidimensional nature (Table 2). This higher-order construct exerts direct effects on three endogenous variables: financial performance (FP), operational performance (OP), and market performance (MP). The results indicate that TQM has a positive and statistically significant influence on both operational performance and market performance. In contrast, the direct effect of TQM on financial performance is weak and not statistically significant. Specifically, the standardized coefficient for the relationship between TQM and FP ($\beta = 0.13$) suggests a low magnitude of association. This finding is further supported by the corresponding p-value ($p = 0.163$), which exceeds the conventional significance threshold ($p > 0.05$), confirming that the direct effect of TQM on financial performance is not statistically significant within the proposed model.

In addition to the direct effects, the results reveal the existence of significant indirect (mediated) effects of TQM on financial and operational performance through market performance. In this mediation structure, TQM exerts a strong positive effect on market performance, which in turn positively influences both financial and operational performance. The indirect effect of TQM on financial performance, calculated as $0.54 \times 0.58 = 0.31$, is statistically significant. Similarly, the indirect effect of TQM on operational performance, estimated as $0.54 \times 0.50 = 0.27$, is also statistically significant. Overall, these findings suggest that the influence of TQM on organizational performance is predominantly indirect, operating through its impact on market performance, which functions as a key mediating mechanism within the structural model.

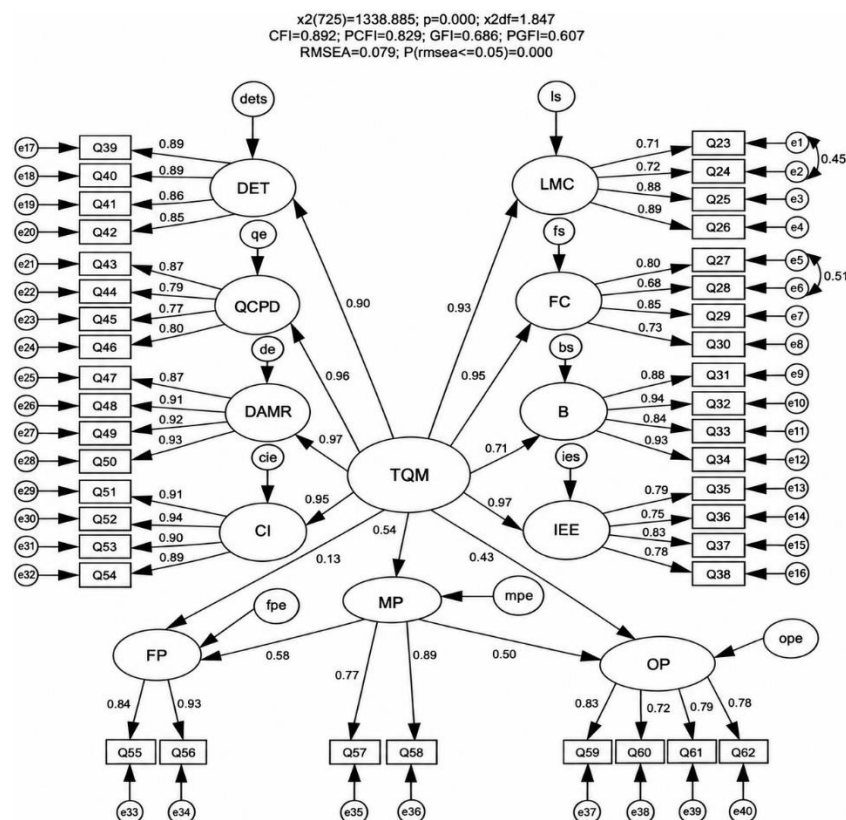


Figure 2: Final Model

The parameter estimates reported in Table 2, together with their corresponding p-values, indicate that hypotheses H2 and H3 are empirically supported at conventional levels of statistical significance. Specifically, the results provide sufficient evidence to confirm the positive and statistically significant effects of TQM on both operational performance (H2) and market performance (H3).

In contrast, the empirical evidence does not support hypothesis H1. The estimated relationship between TQM and financial performance does not reach statistical significance, indicating that no direct effect can be confirmed within the limits of the present model specification and sample. Consequently, H1 is not validated by the data.

Table 2: Scalar estimates

Questions	Dimensions	Estimate	S.E.	C.R.
MP	TQM	0.337	0.062	5.450
LMC	TQM	0.664	0.076	8.755
QCPD	TQM	0.917	0.077	11.899
FC	TQM	0.756	0.073	10.360
DAMR	TQM	0.879	0.071	12.369
B	TQM	0.625	0.073	8.548
CI	TQM	0.887	0.069	12.899
IEE	TQM	0.891	0.083	10.707
OP	TQM	0.272	0.054	5.010
FP	TQM	0.071	0.051	1.394
DET	TQM	0.886	0.078	11.406
OP	MP	0.499	0.100	5.008
FP	MP	0.500	0.095	5.284
Q23	LMC	1.000		
Q24	LMC	1.114	0.103	10.858
Q25	LMC	1.172	0.120	9.746
Q26	LMC	1.332	0.135	9.849
Q27	FC	1.000		
Q30	FC	0.731	0.080	9.188
Q34	B	1.101	0.066	16.809
Q35	IEE	1.000		
Q37	IEE	1.027	0.092	11.141
Q38	IEE	0.901	0.089	10.102
Q39	DET	1.000		
Q40	DET	1.099	0.073	15.138
Q41	DET	1.077	0.077	14.073
Q42	DET	0.997	0.071	14.025
Q47	DAMR	1.000		
Q48	DAMR	1.090	0.068	15.930
Q55	FP	1.000		
Q58	MP	1.116	0.122	9.172
Q60	OP	0.881	0.096	9.142
Q59	OP	1.000		
Q62	OP	0.855	0.086	9.984
Q61	OP	0.917	0.089	10.303
Q57	MP	1.000		
Q56	FP	1.273	0.132	9.633
Q28	FC	0.815	0.069	11.766
Q29	FC	0.927	0.083	11.206
Q33	B	1.060	0.078	13.584
Q36	IEE	1.042	0.109	9.603
Q51	CI	1.000		

Questions	Dimensions	Estimate	S.E.	C.R.
Q52	CI	1.089	0.055	19.820
Q53	CI	1.074	0.062	17.386
Q54	CI	1.023	0.061	16.724
Q45	QCPD	0.844	0.077	11.014
Q46	QCPD	0.861	0.073	11.729
Q49	DAMR	1.108	0.068	16.290
Q50	DAMR	1.166	0.069	16.790
Q43	QCPD	1.000		
Q44	QCPD	1.055	0.092	11.479
Q31	B	1.000		
Q32	B	1.111	0.065	17.203

Research Hypotheses H₄, H₅, H₆ and H₇

Consistent with the analytical procedures adopted in the testing of the preceding hypotheses, this stage aimed to quantify the strength of association between variables through the computation of correlation and/or association coefficients. Although multiple classification schemes exist for interpreting correlation magnitudes depending on variable types and analytical context, this study adopts the classification criteria proposed by Cohen and Holliday (1982) as presented in Table 3 to ensure a standardized interpretation of the observed relationships.

Table 3: Reference values in measuring the association of variables

Eta values	Degree of correlation
Eta < 0.19	Very poor correlation
0.20 < Eta < 0.39	Poor correlation
0.40 < Eta < 0.69	Moderate correlation
0.70 < Eta < 0.89	Strong correlation
0.90 < Eta < 1.00	Very high correlation

In evaluating the proposed hypotheses, the strength of association between the continuous constructs TQM, financial performance (FP), operational performance (OP), and market performance (MP) and the dichotomous variable representing ISO 9000 certification was assessed using the Eta (η) coefficient. This statistic ranges from 0 to 1, where values approaching 0 indicate weak or negligible association, whereas values closer to 1 reflect stronger relationships between variables.

The Eta coefficient is particularly appropriate for examining relationships involving a categorical independent variable and continuous dependent variables, as it captures the degree of association without assuming linearity in the same manner as Pearson's correlation coefficient. Accordingly, it provides a robust measure for evaluating the strength of the relationship between ISO 9000 certification status and the continuous performance and TQM-related constructs considered in this study.

Regarding the sample distribution, Table 4 shows that, out of the 143 valid observations included in the analysis, 66 firms (46.2%) reported holding ISO 9000 quality certification, while 77 firms (53.8%) indicated that they were not certified. This distribution reflects a relatively balanced representation between certified and non-certified service firms within the sample, thereby supporting meaningful comparative analysis between the two groups.

Table 4: Between-subjects factors

Dimension	Value Label	N	Percentage
ISO 9000	Yes	66	46.2
	No	77	53.8

An examination of the results presented in Table 5 and Table 6 indicates that a statistically meaningful association is observed only in the case where ISO 9000 certification is treated as the dependent variable in the context of hypothesis H4. In this specific relationship, the Eta (η) coefficient associated with the TQM construct as the independent variable exhibits a moderate magnitude and reaches statistical significance.

This finding provides empirical support for hypothesis H4, confirming that the implementation of TQM practices is significantly associated with the likelihood of obtaining ISO 9000 certification (Table 5). In contrast, the remaining associations reported in Table 5 and 6 do not demonstrate statistically significant or sufficiently strong relationships to support the corresponding hypotheses under analysis.

Table 5: Directional Measures Nominal by Interval – Eta (ISO 9000 dimension)

Dependent	Eta Value	Partial Eta Squared	Partial Eta Squared×100
ISO 9000	0.697	0.490	49%

Table 6: Directional Measures Nominal by Interval – Eta (FP, OP, and MP dimension)

Dependent	Eta Value	Partial Eta Squared	Partial Eta Squared×100
Financial performance	0.041	0.00168	0.17%
Operational performance	0.146	0.021	2.1%
Market performance	0.072	0.00518	0.52%

The interpretation of Eta squared (η^2) is based on its representation of the proportion of variance in the dependent variable that is attributable to the independent variable. In this context, the results indicate that approximately 49% of the variation in ISO 9000 certification status is explained by the Total Quality Management (TQM) construct. This magnitude of explained variance reflects a moderate-to-substantial association between TQM implementation and the attainment of ISO 9000 certification.

In contrast, the results presented in Table 6 reveal consistently low η^2 values across the relationships examined between ISO 9000 certification and the dimensions of organizational performance. These weak associations indicate that certification status does not meaningfully explain variations in financial, operational, or market performance within the sample. Consequently, the empirical evidence does not support hypotheses H5, H6, and H7, which are therefore not validated.

CONCLUSIONS

TQM is widely recognized as an evolutionary approach to quality management, exerting a significant influence on the development of contemporary managerial practices. Within this framework, organizations seeking sustained competitiveness are required to comply with increasingly complex quality requirements and stakeholder expectations, which has contributed to the widespread adoption of TQM principles as a strategic management philosophy.

The empirical findings of this study indicate that the implementation of TQM practices in Portuguese service firms is associated with improvements in operational and market performance. However, no statistically significant relationship was identified between TQM practices and financial performance. These results are consistent with previous studies (Antunes et al., 2018; Ebrahimi & Sadeghi, 2013; Terziovski & Samson, 1999) which similarly report that TQM contributes to enhanced operational efficiency and competitive positioning, while its direct financial impact remains less evident.

With regard to ISO 9000 quality certification, the results suggest that certified firms within the sample do not exhibit statistically significant improvements across financial, operational, or market performance dimensions. This finding aligns with prior research that has reported weak or non-significant relationships between certification and organizational performance outcomes (Heras-Saizarbitoria et al., 2013; Parast & Fini, 2010; Prajogo & Brown, 2006; Rönnbäck & Witell, 2008; Su et al., 2008). Nevertheless, the results also support

the hypothesis that TQM implementation fosters favorable conditions for the attainment of ISO 9000 certification, consistent with the findings of Antunes et al. (2018).

Overall, although the literature presents mixed and sometimes contradictory evidence regarding the effects of TQM and quality certification on organizational performance, this study contributes to clarifying these relationships within the specific context of Portuguese service firms. In particular, it highlights the predominance of TQM as a performance-enhancing mechanism and positions ISO 9000 certification primarily as a formalization and structuring instrument rather than a direct driver of performance improvement.

From a managerial perspective, the findings suggest that TQM should be interpreted as a long-term strategic philosophy aimed at strengthening internal capabilities, process efficiency, and customer orientation. In contrast, ISO 9000 certification should be understood as a complementary mechanism that may support the implementation of structured quality systems but does not, in itself, guarantee superior organizational performance.

Finally, by adopting a multidimensional view of performance and focusing specifically on service organizations, this study provides additional empirical evidence that contributes to a more nuanced understanding of the interplay between TQM, quality certification, and organizational outcomes in service-based contexts.

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INSTITUTIONAL REVIEW BOARD STATEMENT: This study was approved by the Ethical Committee of the Lisbon Accounting and Business School, Polytechnic University of Lisbon, Portugal [Ref. No. 6/2024], dated [July 1, 2024].

INFORMED CONSENT STATEMENT: Informed verbal consent was obtained from all participants, and all data were anonymized to protect participants' confidentiality.

TRANSPARENCY: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

COMPETING INTERESTS: The authors declare that they have no competing interests.

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