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Article info:
Received 05.10.2019
Accepted 10.03.2020

UDC – 005.6
DOI – 10.24874/IJQR14.03-13



TOTAL QUALITY MANAGEMENT AND QUALITY CERTIFICATION ON SERVICES CORPORATIONS

Abstract: *This research aims to analyze the relationship and the effects of the implementation of Total Quality Management (TQM) practices on quality certification in services corporations and to analyze the impact of TQM and quality certification (ISO 9000) on the organizational performance. A model of structural equations was used to evaluate the relationship between the different dimensions. With the aim to measure the correlation between the continuous variables' and the dichotomous variable ISO 9000, Eta coefficient was used. The results showed that TQM practices in Portuguese service companies provide an improvement in their operational and market performance, however, TQM does not show an improvement in financial performance. Regarding ISO certification, the results indicate that certified companies do not show an improvement in their performance, whether financial, operational or market. Also, our research confirms that the implementation of TQM practices provides the conditions for quality certification.*

Keywords: *Total Quality Management; Organizational Performance; Quality Certification; ISO 9000; Services Corporations.*

1. Introduction

The market of service companies has been registering a markedly increasing and continuous trend in recent years. The changes registered at the level of the global business leads professionals and researchers to look at the drivers of continuous improvement and performance study of service companies.

The service sector is a very sensitive market segment concerning quality management and certification, because its activities consist of something intangible. All companies need to have good people management and well-structured business process management, and in the service sector this concern reflects even its survival and growth. Only in this way can these companies achieve their strategic

objectives.

From a competitive perspective, the existence of quality systems suitable for this type of organization is of great importance. In this way, all service companies seek to adopt and implement a set of operational practices that allow them to respond to the challenges and changes of the competitive environments in which they are inserted, seeking to achieve continuous improvement (Fassoula, 2006). One of these practices is the implementation of Total Quality Management (TQM), which has received great attention because of the effectiveness and efficiency that provides in achieving sustainable competitive advantage and better business performance (Venkatraman, 2007; Arumugam et al., 2009; Salaheldin, 2009). Service organizations,

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therefore, need to adopt critical quality practices and an exceptional quality management system not only to delight customers and increase customer loyalty, but also to seek for excellence in business performance.

Several authors have tried to identify the key practices of TQM to be implemented in service companies, to achieve a performance of excellence (Whiney & Pavett, 1998; Sila & Ebrahimpour, 2002; Kaynak, 2003). Those practices include management commitment, continuous improvement and innovation, customer requirements, employee involvement, teamwork, employee training, and benchmarking. In addition, it is essential to determine the priority of implementation of TQM practices to achieve the maximum benefits and desired goals.

The TQM approach consists of a global effort of all stakeholders in a company, involving top management, all employees, suppliers and customers, and aims to continuously improve the quality of products, services and processes to meet the needs and expectations of customers (Dean & Bowen, 1994; Martinez-Costa & Jimenez-Jimenez, 2009). According to Chowdhury (2014), TQM is the application of quality principles to all departments or functional areas of the organization. York and Miree (2004) define TQM as a set of instruments used by management to provide more value to their customers by identifying their hidden needs and which are sensitive to changes in markets. Likewise, they also seek to improve the efficiency of the procedures of the goods or services rendered. Oakland (1989) also defined TQM as an approach to improving the competitiveness, efficiency, and flexibility of the entire organization.

According to Magd and Curry (2003), there is a complementarity between TQM concepts and quality certification. According to these authors, the focus on quality leads to the implementation of TQM and, in turn, the external recognition of quality leads to the development of ISO 9000, which allows to

conclude that ISO 9000 certification can be used as a proxy for TQM. The ISO 9000 standards are references to the implementation of quality management systems, which represent an international consensus of good management practices, aiming to ensure the supply of products that meet the requirements of customers, always focusing on continuous improvement. ISO 9000 standards are also the basis for the design, implementation, evaluation, specification and certification of quality systems, introducing a common language understandable internationally. According to Teixeira-Quirós et al. (2013), certification has become an essential requirement for companies to remain in the markets. On the other hand, Casadésus and Giménez (2000) stated that the ISO 9000 certification process represents an evolution in the way the organization and the quality system should be managed, being the key to the success of the business management.

Another concept also addressed in this research, refers to the performance of organizations. Organizational performance has proved to be a difficult concept to define and even measure. Among the existing studies about the performance, is possible to state that there isn't a single criterion for defining the performance, which makes difficult to measure or compare the results. According to Harbour (2008), organizational performance can be measured through the implementation of a series of measures that represent the result of the organization's activity. Other authors, namely Peterson et al. (2003), defined organizational performance as the ability of organizations to use their resources efficiently in order to produce results consistent with their strategic objectives. Other studies have considered organizational performance as something that allows to evaluate the success of organizations and to achieve their success (Antony & Bhattacharyya, 2010). To overcome this ambiguity concerning the performance criterion, in this research will be considered three perspectives of

performance, namely, financial, operational, and market performance.

Thus, this research aims to analyze the relationship and the effects of the implementation of TQM practices on quality certification in services corporations, and to analyze the impact of TQM and quality certification (ISO 9000) in the organizational performance.

2. Theoretical Framework

2.1. The relationship between TQM and performance

TQM philosophy results in a total organization-wide effort involving management, all employees, suppliers and customers, and seeks to continuously improve the quality of products, services, and processes to meet customer needs and expectations (Dean & Bowen, 1994; Martinez-Costa & Jimenez-Jimenez, 2009). TQM has been considered as an evolution in quality management approach, playing a key role in the development of new management practices. TQM can be defined as a set of techniques and procedures used to improve the efficiency, reliability and quality (Steingrad & Fitzgibbons, 1993). Vuppapapati et al. (1995) defined TQM as a management philosophy for continuous improvement of products and processes quality which aims to achieve customer satisfaction (Antunes et al., 2018).

According to Voon et al. (2014), the various elements of TQM for the development of service quality consist of the total involvement of employees, continuous improvement, continuous training, teamwork, commitment and support of management, democratic management style, focus on customer satisfaction, and adoption of a quality culture. Several studies on TQM suggest that there is a positive relationship between its implementation and the financial performance of corporations, however, other empirical studies have produced mixed

results. The quality improved should provide a reduction in costs and thus produce a positive result for financial performance. It will be expected that higher quality products or services will increase the retention rate of existing customers and attract new ones, thereby strengthening market share and revenues (Rust et al., 1994; Slater & Narver, 1995; Sterman et al. 1997). In addition, better quality products or services also lead to increased consumer loyalty, stock prices and productivity, while reducing customer complaints (Rust et al., 1994; Hendricks & Singhal, 1996).

Several researchers analysed the relationship between the TQM implementation and organisational performance (Easton & Jarrell, 1998; Samson & Terziovski, 1999; Brah et al., 2002; Brah & Lim, 2006; Demirbag et al., 2006; Feng et al., 2006; Antunes et al., 2018), and many of the studies that have examined the impact of TQM in obtaining competitive advantage have shown that its presence leads to improved performance and increased competitiveness (Anderson & Sohal, 1999; Lee et al., 1999; Terziovski & Samson, 1999; Zhang, 2000; Teixeira-Quirós & Justino, 2013; Teixeira-Quirós et al., 2013; Ebrahimi & Sadeghi, 2014; Antunes et al., 2018). Other studies have demonstrated positive results between TQM and quality levels achieved, resulting, thus, in a better organisational performance (Flynn et al., 1995; Ahire et al., 1996; Terziovski & Samson, 1999; Prajogo & Sohal, 2003, 2004; Costa & Lorente, 2004; Arumugam et al., 2008; Beck & Walgenbach, 2009). However, other authors didn't find in their investigations any evidence that organisations had obtained any competitive advantage with the implementation of the TQM practices (Agus & Abdullah, 2000; Han et al., 2007). Some authors have pointed out that the issue may be in the way how TQM is implemented, once its implementation reveals a complex and difficult process and its advantages are not easy to verify (Hackman & Wageman, 1995; Rad, 2006).

The analysis of the performance of organizations and, consequently, the

evaluation of the effects of the implementation of TQM practices, presents a great challenge, since this theme has been approached from different perspectives. Some authors considered performance only at operational levels, such as Samson and Terziovski (1999), while others, such as Hendricks and Singhal (2001) or York and Miree (2004) measured only financial performance. Kaynak (2003) identified and validated three dimensions of company performance, namely, financial and market performance, quality performance, and stock management performance. In the same perspective, Calvo-Mora et al. (2014) stated that the effects of TQM are measured through three types of results, namely, quality, operating results and economic-financial result. Concerning the performance dimensions of service companies, some authors have analyzed financial and operational performance as dimensions that are affected by TQM (Brah et al., 2000; Kaynak, 2003). Many studies have also considered another dimension of performance in the service sector, and it refers to customer satisfaction (Agus et al., 2000; Brah et al., 2002; Sit et al., 2009). Many authors have also included the performance of service or product quality as a key indicator of the performance of a service activity (Hasan & Kerr, 2003; Prajogo, 2005; Brah & Lim, 2006; Kumar et al., 2009).

Thus, in view of the purpose of the present research, considering the theoretical framework and the analysis of previous studies, the following research hypotheses were formulated and examined:

H1: Services corporations that implement TQM practices reveal an improvement in their financial performance.

H2: Services corporations that implement TQM practices reveal an improvement in their operational performance.

H3: Services corporations that implement TQM practices reveal an improvement in their market performance.

2.2. The relationship between TQM and quality certification

The ISO 9000 standards are references to the implementation of quality management systems, which represent an international consensus of good management practices, aiming to ensure the supply of products that meet the requirements of customers, always focusing on continuous improvement. These are focused on compliance with the minimum quality system requirements that should encompass all organizational processes and have been adopted by most companies worldwide. These companies can, in fact, benefit from the quality assurance process if they see this process as an opportunity to organize and improve their internal and quality operations, creating a dynamic and constantly improving quality system that can translate into a TQM approach (Tsiotras & Gotzamani, 1996; Gotzamani & Tsiotras, 2001). Regardless of the nature of the business, the efficient implementation and management of the ISO 9000 quality certification system is consistent and supported in the total quality culture, and this culture focuses on medium and long-term results and continuous improvement. However, does this mean that the implementation of TQM practices is an indispensable prerequisite for the certification of services organizations?

According to Casadesús and Giménez (2000), the process of ISO 9000 certification represents an evolution in the way the organization and the quality system should be managed, being the key to the success of the business management. It will then be easily understood that if an organization intends to obtain quality certification it will necessarily have to adopt a set of practices focused on quality, since only through continuous improvement, customer focus, employee involvement, management commitment, among other dimensions of TQM, the organization will be able to achieve the required quality levels for its certification.

Thus, the following hypothesis of research is defined:

H4: The implementation of TQM practices in service companies provides the conditions for quality certification.

2.3. Quality certification and its effects on performance

Service companies are of great importance to the world economy and have come to assume a significant expression in the business world (Lee et al., 2009; To et al., 2011). For these companies to compete in today's highly demanding and competitive markets, it will be necessary to define well-designed and implemented internal management systems in accordance with internationally recognized quality standards, such as ISO 9000 quality certification standards. ISO 9000 standards consist of a management system applicable to all types of enterprises, considering their size, whether public or private, or whether they are industrial, commercial or service enterprises (Walker & Johnson, 2009; To et al., 2011). Although initially there was a great manifestation of interest and adoption of these standards by industrial companies, nowadays it is the service companies that focus more on this issue of certification, aiming at the adoption of quality management practices and standards (Ronnback & Witell, 2008).

ISO 9000 standards are references to the implementation of quality management systems, introducing a common language comprehensible globally. According to Texeira-Quirós et al. (2013), certification has become an indispensable requirement for companies to stay in the markets. For Casadesús and Gimenez (2000), the ISO 9000 certification process is an evolution in the way organizations and quality systems should be managed, being the key to the success of business management. The set of international standards ISO 9000 was created to standardize the quality systems, becoming a prerequisite in many organizations, to attract new clients and markets.

Some researchers have shown benefits obtained with certification (Ittner & Larcker, 1997; Samson & Terziovski, 1999; Casadesús & Giménez, 2000; Martínez-Costa & Martínez-Lorente, 2004), while others did not find great advantages (Terziovski & Samson, 1997, Corbett et al., 2005, Feng et al., 2008). Several studies have found a direct, positive and significant relationship between quality certification and financial performance (Psomas et al. 2013; Kim et al. 2011; Sampaio et al. 2011a; Psomas et al., 2010; Srivastav 2011; Wu & Liu, 2010). However, other studies did not find advantages in the application of ISO 9000 standards (Prajogo & Brown, 2006; Ronnback & Witell, 2008; Su et al., 2008; Lee et al., 2009; Parast & Fini, 2010; Sampaio et al., 2011b; Heras-Saizarbitoria et al., 2013). Some studies have even revealed a negative relationship between these two dimensions (Aarts & Vos, 2001; Yeung et al., 2011). In other situations, it was reported that the ISO 9000 standards do not have significant effects on financial performance (Martínez-Costa et al., 2009) and in other investigations mixed results have been identified (Benner & Veloso, 2008, Terziovski & Power, 2007).

However, it is also extremely important to explore the effect of quality certification on other strands of performance, in addition to the purely financial approach. Among the various non-financial measures, the following may be considered: human resources management, product/service quality, customer satisfaction, delivery times, innovation strategies, strategic objectives, efficiency, productivity, leadership, employee satisfaction, and overall local and international business performance (Psomas & Kafetzopoulos 2014). Most of the studies showed a positive relationship between the implementation of the ISO standards and the non-financial benefits of the company, which allows to relate the financial benefits that companies can achieve through the development of non-financial measures (Padma et al. 2008; Psomas et al. 2013; Kim et al. 2011). In this way, this research also

aims to analyze the possible relationship between the implementation of the ISO 9000 standards and the financial, operational and market performance of services organizations. With that goal in mind, the following three research hypotheses are now defined:

H5: Certified services corporations reveal an improvement in their financial performance.

H6: Certified services corporations reveal an improvement in their operational performance.

H7: Certified services corporations reveal an improvement in their market performance.

Completed the description of the fundamentals that led to the construction of the initial issues through the literature review, the next section will describe the study.

3. Methodology

3.1. Sample characterization and questionnaire development

Data of the companies used for this research were obtained through the SABI database (Analysis System of Iberian Balances). Portuguese companies were selected, with certain criteria being defined to obtain a feasible number of companies for the investigation. These criteria consisted in the fact that the companies have available and valid email contact, should show accounting information for the last year before the research, and be considered small and medium-sized enterprises, given the typology defined in Portuguese Decree-Law. The total sample consisted of 946 companies, and 287 completed questionnaires were received, of which 143 were related to service companies. The final sample of this investigation was thus focused on the responses of 143 service companies, which consisted of companies of the most varied activities.

The invitation to participate in the research was done through an email, which contained a link to access the questionnaire, being this the instrument of information collection. The

period for submitting the questionnaire and data collection lasted for two months and took place between May and June of 2015. The questionnaire was designed with closed questions, using a Likert scale of five points for the evaluation of the opinions of respondents about the considered dimensions, having the respondents selected for each answer one of the options available on a scale from '1 = strongly disagree' to '5 = strongly agree' (for TQM dimension) or on a scale from '1 = extremely unsuccessful' to '5 = extremely successful' (for the dimension concerning the financial, operational and market performance). For the characterization of the respondents and organizations, nominal and ordinal scales were used, and for the assessment of quality certification were used a dichotomous variable (yes/no).

3.2. Data Analysis

Regarding the statistical treatment, the model of structural equations was used to evaluate the relationship between the dimensions of TQM and FP, OP and MP. The multiplicity of relations between the variables tangles the systems of equations, opting for their visual representation in causal diagrams or path diagrams. Path Analysis is a technique like regression, but with explanatory capacity, which analyzes the direct and indirect effects on the set of observable variables, assuming the existence of linear relations between them and the absence of measurement errors of the variables. The descriptive analysis of the various variables was carried out to know the behavior of each item, within each of the sub-dimensions. Next, the normality hypothesis was verified, since the application of some techniques depends on the fulfillment of this condition. Regarding the TQM dimension, eight items were considered, namely management's commitment (MC), focus on customer (FC), involvement/empowerment of employees (IEE), development/employees training (DET), quality/conception and product design (QCPD), data

analysis/measurement of results (DAMR), benchmarking (B), and continuous improvement (CI).

The correlations of the TQM construct, recorded in Table 1, range from moderate to high values. The lowest correlation (0.434) is established between items Q30*Q27 in the FC variable, and it should be referred that it is

in this variable that the lower correlations are noted. The highest correlation (0.877) is associated with items Q51*Q52 in the CI variable. It should be noted that in the variable DAMR, five of the six correlations are the highest, which indicates a strong consistency between the items that make up the subdimension.

Table 1. Correlations of the TQM construct
Leadership/Management's commitment

	Q23	Q24	Q25	Q26
Q23	1			
Q24	.703**	1		
Q25	.646**	.655**	1	
Q26	.576**	.619**	.797**	1

<i>Benchmarking</i>				
	Q31	Q32	Q33	Q34
Q31	1			
Q32	.805**	1		
Q33	.770**	.735**	1	
Q34	.806**	.875**	.812**	1

<i>Development/Employees training</i>				
	Q39	Q40	Q41	Q42
Q39	1			
Q40	.794**	1		
Q41	.710**	.777**	1	
Q42	.697**	.727**	.748**	1

<i>Data analysis/Measurement of results</i>				
	Q47	Q48	Q49	Q50
Q47	1			
Q48	.821**	1		
Q49	.759**	.823**	1	
Q50	.792**	.872**	.858**	1

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

The normality of the eight variables that integrate the TQM construct was analyzed with the basis of the formal Kolmogorov-Smirnov test (K-S) and inspection of the respective histogram (Figure 1). Based on the significance associated with the test statistic, it is verified that all variables are not adjusted

to the Normal Distribution traced. However, by graphical interpretation, it is verified that only the IEE and FC variables show a more pronounced asymmetry, and the remaining variables presenting traces of similar distributions, moderately asymmetrical.

<i>Focus on customer</i>				
	Q27	Q28	Q29	Q30
Q27	1			
Q28	.743**	1		
Q29	.611**	.531**	1	
Q30	.434**	.520**	.651**	1

<i>Involvement/Empowerment of employees</i>				
	Q35	Q36	Q37	Q38
Q35	1			
Q36	.721**	1		
Q37	.579**	.568**	1	
Q38	.542**	.556**	.716**	1

<i>Quality/Conception and product design</i>				
	Q43	Q44	Q45	Q46
Q43	1			
Q44	.727**	1		
Q45	.611**	.643**	1	
Q46	.626**	.587**	.657**	1

<i>Continuous improvement</i>				
	Q51	Q52	Q53	Q54
Q51	1			
Q52	.887**	1		
Q53	.765**	.805**	1	
Q54	.763**	.808**	.825**	1

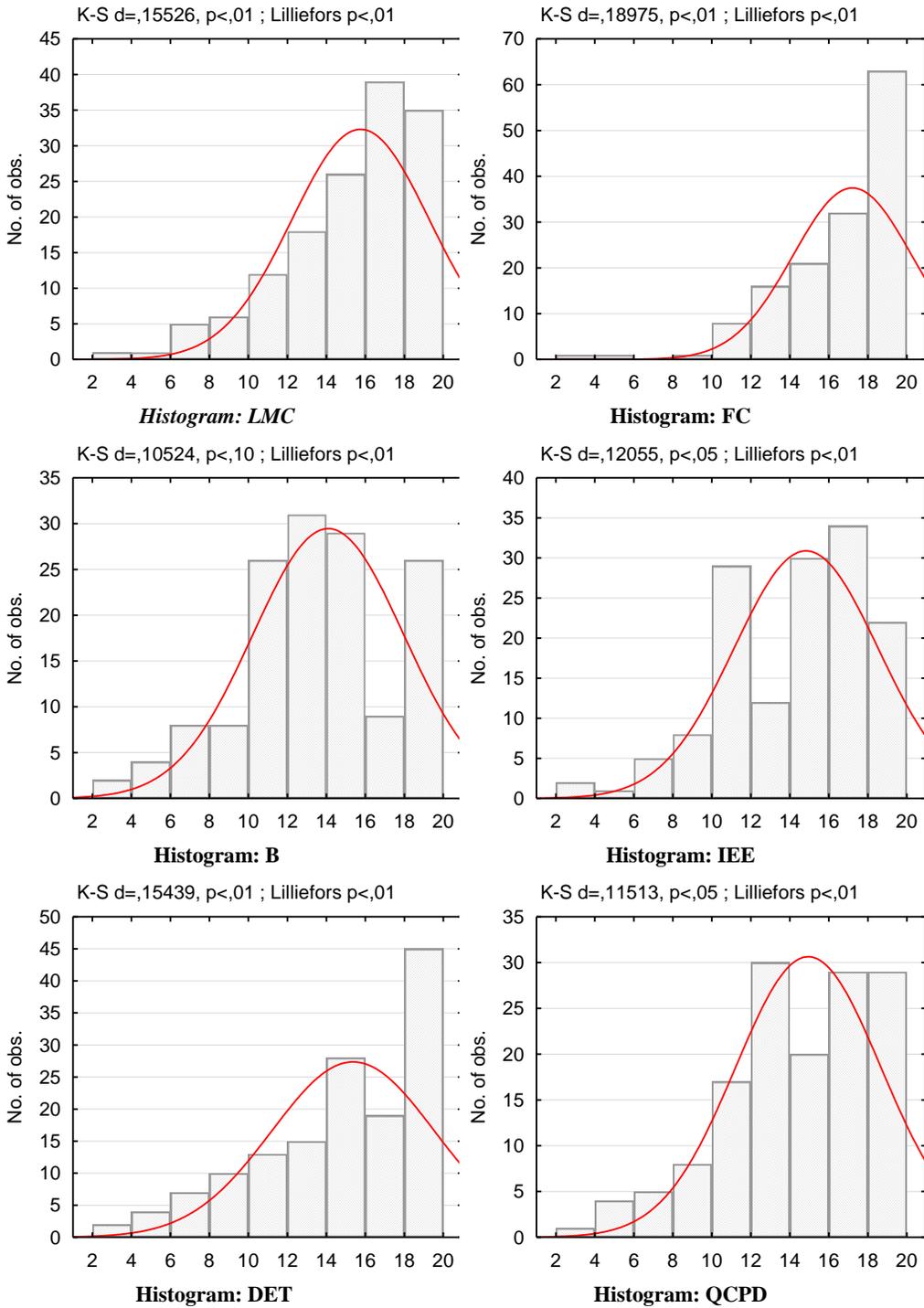


Figure 1. Normality of TQM variables

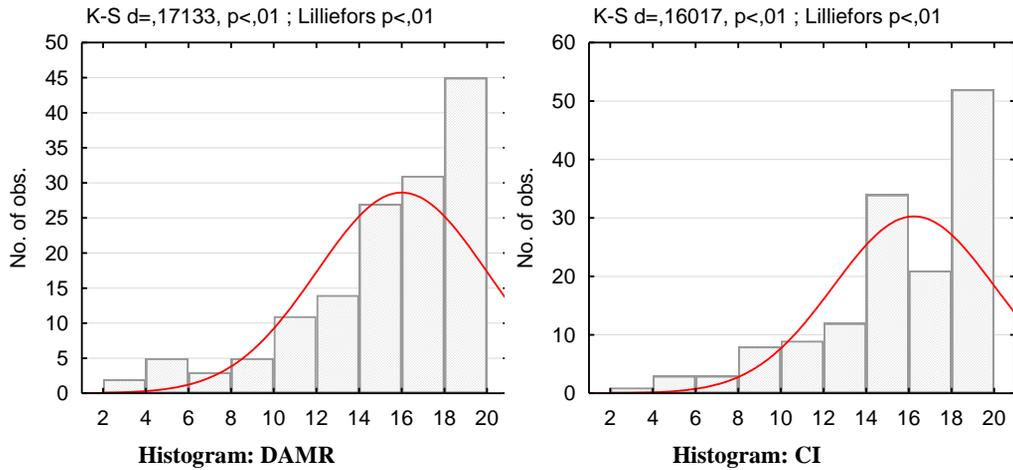


Figure 1. Normality of TQM variables (continued)

The correlation between the variables that make up the TQM construct reveals between moderate (0.447), in relation to the link between variables B and LMC, and high

(0.853) between the CI and DAMR variables, and all correlations were statistically significant for any value of significance proposed by the investigator (Table 2).

Table 2. Correlations of TQM items

	LMC	FC	B	IEE	DET	QCPD	DAMR	CI
LMC	1							
FC	.644**	1						
B	.447**	.467**	1					
IEE	.648**	.612**	.585**	1				
DET	.736**	.641**	.476**	.713**	1			
QCPD	.745**	.583**	.497**	.716**	.747**	1		
DAMR	.721**	.775**	.489**	.762**	.790**	.775**	1	
CI	.741**	.735**	.557**	.703**	.740**	.805**	.853**	1

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

3.2.1. Hypotheses H1, H2, and H3

After identifying the different specifications of each of the items and the different variables that make up the TQM construct, the sub model was identified. Some adjustments were necessary to the model of structural equations to improve the quality of the adjustment of the overall model. It is relevant to note that a model can be artificially modified to perfection through the analysis of the modification indexes and, consequently, by the establishment of the trajectories suggested by the indicators.

The final model (Figure 2) presents the standardized estimates of the model and the significance of the trajectories. This model defined a factor of 2nd order designated by TQM which statistically directly affects the financial performance (PF), the market performance (MP), and the operational performance (OP). The perception of TQM performance is a determinant PF, MP and OP, being the stronger performance, the one that is mediated by MP. The value $\beta_{FP.TQM} = 0.13$ is low and may be indicative of a non-statistically significant correlation. We confirm that the associated p-value, equal to $0.163 > 0.050$ (Table 3) justifies that the

effect of TQM on FP is not statistically significant. Indeed, based on the above, the TQM effect on FP and OP is mediated by the MP, being the mediation effect equal to 0.54

$\times 0.58 = 0.31$ and $0.54 \times 0.50 = 0.27$, respectively. These standardized estimates are presented as indirect effects and all of them are statistically significant.

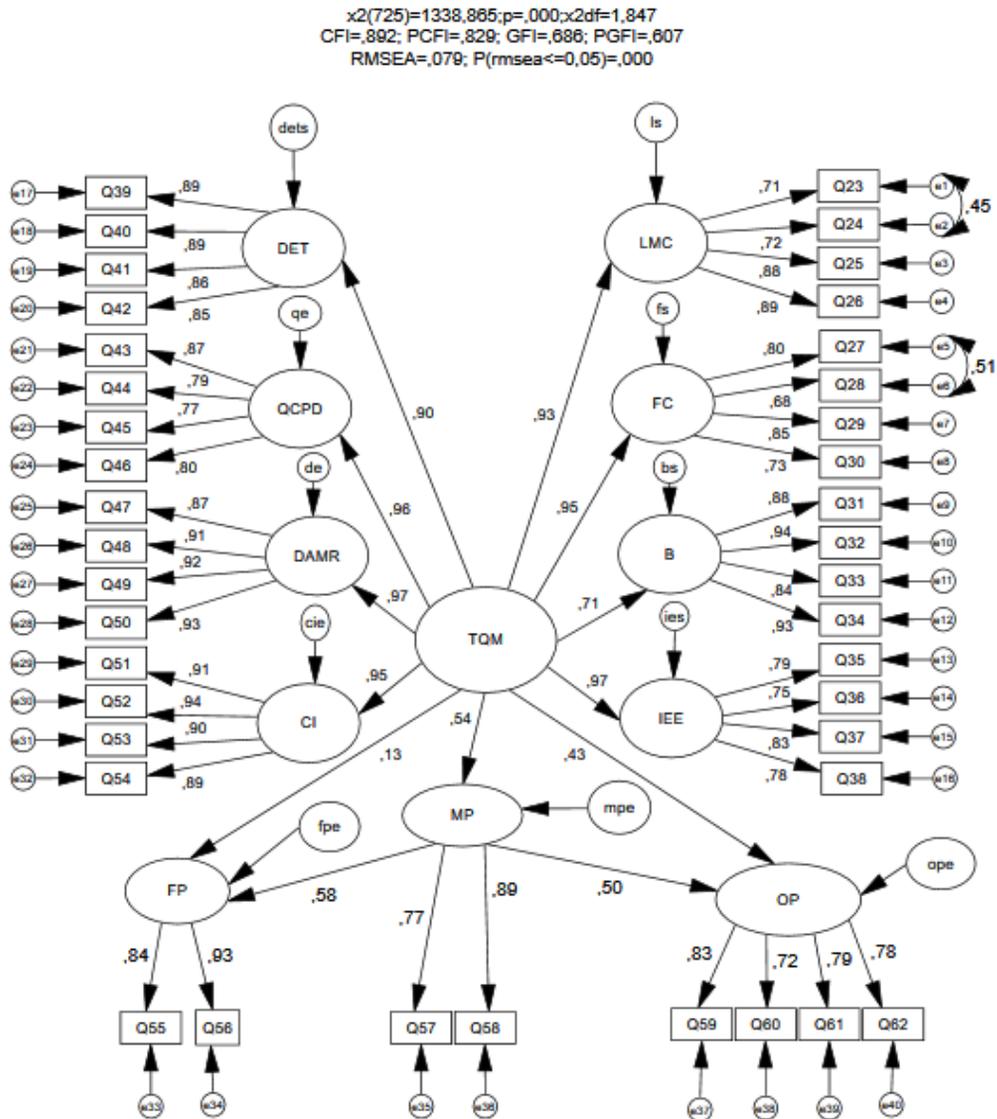


Figure 2. Final global model

The estimates in Table 3, with the respective associated p-values, show that hypotheses H2 and H3 are statistically validated. However,

the results do not allow to validate the hypothesis H1.

Table 3. Scalar estimates

			Estimate	S.E.	C.R.	P	
MP	<---	TQM	.337	.062	5.450	***	
LMC	<---	TQM	.664	.076	8.755	***	
QCPD	<---	TQM	.917	.077	11.899	***	
FC	<---	TQM	.756	.073	10.360	***	
DAMR	<---	TQM	.879	.071	12.369	***	
B	<---	TQM	.625	.073	8.548	***	
CI	<---	TQM	.887	.069	12.899	***	
IEE	<---	TQM	.891	.083	10.707	***	
OP	<---	TQM	.272	.054	5.010	***	
FP	<---	TQM	.071	.051	1.394	.163	
DET	<---	TQM	.886	.078	11.406	***	
OP	<---	MP	.499	.100	5.008	***	
FP	<---	MP	.500	.095	5.284	***	
Q23	<---	LMC	1.000				
Q24	<---	LMC	1.114	.103	10.858	***	
Q25	<---	LMC	1.172	.120	9.746	***	
Q26	<---	LMC	1.332	.135	9.849	***	
Q27	<---	FC	1.000				
Q30	<---	FC	.731	.080	9.188	***	
Q34	<---	B	1.101	.066	16.809	***	
Q35	<---	IEE	1.000				
Q37	<---	IEE	1.027	.092	11.141	***	
Q38	<---	IEE	.901	.089	10.102	***	
Q39	<---	DET	1.000				
Q40	<---	DET	1.099	.073	15.138	***	
Q41	<---	DET	1.077	.077	14.073	***	
Q42	<---	DET	.997	.071	14.025	***	
Q47	<---	DAMR	1.000				
Q48	<---	DAMR	1.090	.068	15.930	***	
Q55	<---	FP	1.000				
Q58	<---	MP	1.116	.122	9.172	***	
Q60	<---	OP	.881	.096	9.142	***	
Q59	<---	OP	1.000				
Q62	<---	OP	.855	.086	9.984	***	
Q61	<---	OP	.917	.089	10.303	***	
Q57	<---	MP	1.000				
Q56	<---	FP	1.273	.132	9.633	***	
Q28	<---	FC	.815	.069	11.766	***	
Q29	<---	FC	.927	.083	11.206	***	
Q33	<---	B	1.060	.078	13.584	***	
Q36	<---	IEE	1.042	.109	9.603	***	
Q51	<---	CI	1.000				
Q52	<---	CI	1.089	.055	19.820	***	
Q53	<---	CI	1.074	.062	17.386	***	
Q54	<---	CI	1.023	.061	16.724	***	
Q45	<---	QCPD	.844	.077	11.014	***	
Q46	<---	QCPD	.861	.073	11.729	***	
Q49	<---	DAMR	1.108	.068	16.290	***	
Q50	<---	DAMR	1.166	.069	16.790	***	
Q43	<---	QCPD	1.000				
Q44	<---	QCPD	1.055	.092	11.479	***	
Q31	<---	B	1.000				
Q32	<---	B	1.111	.065	17.203	***	

3.2.2. Hypotheses H4, H5, H6, and H7

Like the analyzes carried out in the verification of the previous hypotheses, it was intended to measure the degree of association between variables using the calculation of correlation or association coefficients. There are many criteria to classify the degree of correlation between variables of the nature of the variables of our study, however, in our research, we considered the criteria of Cohen and Holliday (1982), presented in Table 4.

Table 4. Reference values for measuring the degree of 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 the evaluation of these hypotheses, to measure the correlation between the

continuous variables' TQM, FP, OP, MP and the dichotomous variable ISO 9000, we used the calculation of the Eta coefficient. This coefficient assumes values between 0 and 1, with values close to 0 indicating a weak association and close to 1 indicating a strong association between variables.

From the 143 observations in the sample of our research, there were 66 observations (46.2%) that responded to have ISO 9000 Quality Certification and 77 (53.8%) recognized that they did not have this certification.

Through the observation of the elements in Table 5, it is verified that only the ETA value is shown to be moderate and statistically significant when the variable ISO 9000 is considered as the dependent variable in the verification of the hypothesis H4 which involves the TQM construct as an independent variable, making it possible to validate the hypothesis H4.

Table 5. Directional measures nominal by interval - Eta

Dependent	Eta Value	Partial Eta Squared	Partial Eta Squared x 100
Iso 9000	0.697	0.490	49%
Financial Performance	0.041	0.00168	0.17%
Operacional Performance	0.146	0.021	2.1%
Market Performance	0.072	0.00518	0.52%

The interpretation of the ETA square is understood as the proportion of the variation in the dependent variable that is explained by the independent variable. Thus, 49% of the variation in obtaining ISO 9000 certification is explained by the TQM construct, revealing a moderate association between obtaining ISO 9000 certification and TQM. Table 5 also shows that all values indicate very low associations, thus not being possible to validate the hypotheses H5, H6 and H7.

4. Conclusions

TQM has been assumed as an evolution in the approach to quality management, playing a key role in the development of new management practices. It is certain, then, and

easily understood, that companies that aspire to be successful in their business area will necessarily have to meet the various requirements of higher quality levels to meet internal and external expectations, leading to implementation of TQM practices. The results of our investigation allow us to conclude that TQM practices in Portuguese service companies provide an improvement in their operational and market performance, however, they do not show any relation regarding financial performance. These results are supported by earlier investigations such as Terziovski and Samson (1999), Teixeira-Quirós and Justino (2013), Teixeira-Quirós et al. (2013), Ebrahimi and Sadeghi (2014), and Antunes et al. (2018b), which have shown that their presence leads to

improved performance and increased competitiveness. An interesting evidence obtained by our investigation is that TQM does not show an improvement in the financial performance of service companies. Regarding ISO 9000 quality certification, the results obtained indicate that the certified companies of our sample do not show an improvement in their performance, whether financial, operational or market. Previous studies obtained results in the same direction, not having been found great advantages between the quality certification and the performance of the companies (Prajogo & Brown, 2006; Ronnback & Witell, 2008; Su et al., 2008; Lee et al., 2009; Parast & Fini, 2010; Sampaio et al., 2011b; Heras-Saizarbitoria et al., 2013). However, our research supports the hypothesis that the implementation of TQM practices in service companies provides the conditions for quality certification, which is in line with the study by Antunes et al. (2018b).

Several previous studies were conducted looking at the issues of the implementation of TQM and quality certifications and their effects on business performance. However, this study enriches the literature by filling the gap of some disagreements identified in the previous studies, not only with respect to the ambiguity of the results obtained in those studies but also in the different interpretations of the studied concepts. In our research, we considered the performance in three different approaches and our sample was focused on services corporations. The market of service companies has been registering a markedly increasing and continuous trend in recent years and the studies in this type of corporations are still scarce. So, we consider that our research brings an additional contribution to the knowledge of these subjects, in particular in this type of corporations.

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