Serv Bus (2017) 11:23–43
DOI 10.1007/s11628-015-0298-6

EMPIRICAL ARTICLE

Does quality management improve performance or vice versa? Evidence from the hotel industry

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Received: 2 September 2014 / Accepted: 18 November 2015 / Published online: 27 November 2015

Abstract This paper has several aims: (a) to identify an empirical taxonomy of quality management (QM), (b) to assess whether more advanced QM hotels achieve better performance levels and (c) to analyse whether hotels with better performance levels have more advanced QM levels. This paper contributes to identify a taxonomy of QM in hotels showing the association between a particular level of QM and different performance dimensions. In addition, the paper sheds light on the possible selection effect in the hotel industry. The study finds that hotels with higher QM levels have better hotel guest satisfaction and employee satisfaction, efficiency and better business performance. It also shows that hotels with better performance levels develop QM to a greater extent. Accordingly, QM level is one factor among others that explain better performance levels in hotels. Also, good performance can facilitate the implementation of QM practices.

Keywords Quality management · Performance · Cluster analysis · Selection effect · Hotel industry

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1 Introduction

Quality management (QM) is a management system that includes a set of practices (leadership, people management, stakeholder focus, planning, information and analysis, process management and supplier management) for managing an organization (Dale 1999; Tarí et al. 2007) that may have positive effects on performance in manufacturing and service companies. The effects of QM on firm performance and competitiveness have been extensively examined in the literature, but results are inconclusive. Although most scholars have found positive effects of QM implementation (Duh et al. 2012; Lee 2012; Lee et al. 2009; Molina-Azorín et al. 2009; Tarí et al. 2014; Yunis et al. 2013), others have shown that organizations do not achieve any benefits from QM (Lo et al. 2011; Yeung and Chan 1998; Yeung et al. 2006). These mixed results suggest that more empirical studies about this relationship are needed.

Most studies have examined this relationship using regression analysis, structural equation modelling or similar techniques in order to identify direct and indirect relationships between QM practices and performance in manufacturing and service organizations (Alonso-Almeida et al. 2015; Kaynak 2003; Prajogo 2005; Sila 2007; Tarí et al. 2007; Yang 2006). A few studies have identified an empirical taxonomy of QM in the manufacturing and service industries and then examined its association with performance (Lee et al. 2009; Yeung et al. 2003) as a way of supplementing previous studies on direct and indirect relationship between QM practices and performance. In addition, although most previous studies have examined the effects of QM on performance, very few studies indicate a relationship in the reverse direction, namely as a selection effect, whereby firms with better performance levels are those companies that implement QM (Dick et al. 2008).

In the case of hotels, previous studies have examined the effects of QM on performance (e.g. Alonso-Almeida et al. 2012; Nicolau and Sellers 2010; Wang et al. 2012) although the hotel industry has been examined to a lesser extent than manufacturing organizations (Rubio-Andrada et al. 2011; Wilkins et al. 2007). In addition, to the best of our knowledge, there have been no studies on selection effects in the hotel industry. Therefore, new studies about these topics will be interesting to extend the knowledge about a taxonomy of QM and the selection effect to the hotel context.

This paper has several aims: (a) to identify an empirical taxonomy of QM in the hotel industry, (b) to assess whether more advanced QM hotels achieve better performance levels and (c) to analyse whether hotels with better performance levels have more advanced QM levels. The contribution of this paper is, first, that it identifies a taxonomy of QM in hotels showing the association between a particular level of QM and different performance dimensions. Few studies have identified an empirical taxonomy of QM mainly in the hotel industry. Second, the paper sheds light on the possible selection effect in the hotel industry.

The rest of the paper is organized as follows. The following section reviews the literature on QM, performance and the selection effect. Then, methods used in this

study to test our hypotheses are described, and the main findings are presented. Finally, the paper presents a discussion of the results and conclusions.

2 Literature review

2.1 Taxonomies of quality management and performance

The literature offers a number of classifications of levels of QM (e.g. Claver and Tarí 2003; Lee et al. 2009; Yeung et al. 2003; Zhao et al. 2004). These studies examining an empirical taxonomy of QM have analysed manufacturing and service organizations, and they have shown that performance levels are enhanced at the different development levels of QM practices.

In addition, some scholars have suggested the need for further studies analysing the association with business performance, especially in service industries. For example, Lee et al. (2003) showed that manufacturing and service organizations with better QM system implementation have significantly better outcomes in customer and people performance. Yeung et al. (2003) identified four types of QM systems in manufacturing firms: undeveloped quality system, framed quality system, accommodating quality system and strategic quality system. The authors indicated that different aspects of organizational performance (efficiency, customer satisfaction and business performance) are improved at different stages of development of QM practices. Organizations develop their QM first by establishing a framed quality system which improves operations and reduces mistakes. This can lead to some operational benefits "but not lifting up the organizational performance as a whole. When they further develop their QM systems, they accommodate their QM system and achieves slight improvement […] but the overall organizational performance, especially marketing growth and financial gains, cannot be achieved until a strategic quality system is established" (Yeung et al. 2003).

Zhao et al. (2004) identified four different levels of QM practices in service organizations: undeveloped quality system, accommodating quality system, soft quality system and strategic quality system. They found that service organizations with undeveloped quality systems generally reported poor business results and when organizations improve their quality system they achieved better employee satisfaction, customer results, effectiveness and business performance. Accordingly, those service organizations with better QM levels achieve better performance levels.

Claver-Cortés et al. (2008) and Lee et al. (2009) identified two levels of QM practices in which one group developed all QM practices to a higher extent than the other cluster. Similarly, those organizations with a higher level of QM practices performed significantly better than those in the group with a lower level on the performance variables analysed (e.g. customer satisfaction, efficiency, cost of poor quality and employee turnover rate).

These studies on empirical taxonomies of QM have shown that organizations with a higher level of adoption of QM practices outperformed those with a relatively lower level of implementation of QM practices in customer satisfaction, employee satisfaction, efficiency and business performance. In relation to customer

satisfaction, the positive effect of QM on customers can be due to the fact that QM practices reduce complaints, encourage repeat purchasing and improve service quality (Alonso-Almeida et al. 2015; Casadesús and Karapetrovic 2005; Doeleman et al. 2014; Gustafsson et. al 2003; Lai and Cheng 2003; Lee et al. 2009; Sila 2007; Singh 2008). The literature has also found that QM in hotels may increase hotel guest satisfaction (Alonso-Almeida et al. 2012; Nield and Kozak 1999; Wang et al. 2012). Based on this previous literature review, the following hypothesis is suggested for the hotel industry:

H1 The higher the QM level, the better the hotel guest satisfaction.

Similarly, these studies on empirical taxonomies of QM have also shown that the organizations with a higher level of adoption of QM practices have better employee results. For example, in a QM context, employees receive more training (Doeleman et al. 2014; Gupta 2000; Renuka and Venkateshwara 2006; Sila 2007), increase their responsibilities and participation in problem solving (Liu and Liu 2014), and have a clearer knowledge of their tasks (Chow-Chua et al. 2003; Lee et al. 2009) allowing them to know better how to carry out the organization processes (Alonso-Almeida et al. 2015). In the context of the hotel industry, Callan (1992) finds that QM systems reduce staff turnover and waste. Walker and Salameh (1996) show that QM may result in positive changes in employee turnover, enthusiasm, cooperation and communication. Nield and Kozak (1999) also find that QM systems have positive effects on employees. Accordingly, QM practices may increase employee satisfaction and the following hypothesis is proposed for the hotel industry:

H2 The higher the QM level, the better the employee satisfaction.

The studies on empirical taxonomies of QM have also found that organizations with a higher level of adoption of QM practices outperformed those with a relatively lower level of implementation of QM practices in efficiency. This is due to the fact that QM practices facilitates that processes are developed in a more efficient way (Chow-Chua et al. 2003; Lee et al. 2009). For example, organizations that adopt QM experience a greater reduction in costs (Boulter et al. 2013; Singh 2008) through eliminating scrap and rework. In the context of the hotel industry, the literature has also found that QM in hotels may enhance efficiency (Rubio-Andrada et al. 2011). Accordingly, the following hypothesis is proposed:

H3 The higher the QM level, the better the efficiency.

Finally, these studies on empirical taxonomies of QM have also shown that organizations with a higher level of adoption of QM practices have better business performance levels. For example, QM may have positive effects on sales and market share (Albacete-Saéz et al. 2011; Doeleman et al. 2014; Kaynak 2003). In the context of the hotel industry, the literature has also found that QM in hotels may increase business performance (Nicolau and Sellers 2010; Rubio-Andrada et al. 2011; Wang et al. 2012). Talib et al. (2013) have indicated that some QM practices (e.g. training, benchmarking, quality culture and quality systems) are positively related to quality results in service companies, including hotels. These ideas suggest the following hypothesis:

H4 The higher the QM level, the better the business performance.

2.2 Selection effect

The previous review suggests that higher quality implies lower costs and increased productivity, which in turn gives the firm a greater market share and better competitive levels (Deming 1982; Evans and Lindsay 2002). Firms with a higher level of QM may achieve customer and people satisfaction, process improvement and better supplier management (Alonso-Almeida et al. 2015; Kim et al. 2012; Lee et al. 2009). This facilitates an improvement of performance levels.

In spite of this general idea about the benefits of QM practices, some scholars have also suggested that those firms with better performance levels are those implementing QM systems. Those studies have shown that the propensity to implement QM is higher in firms with better financial performance. For example, Heras et al. (2002) showed that firms with a better financial performance have a higher propensity to seek quality certification. Dick et al. (2008) also found a reverse attribution between quality certification and performance. This could be due to the fact that it is easier for more profitable firms to seek certification because they find the cost easier to absorb than less profitable firms. The authors then indicated that better performance preceded quality certification. Prajogo and McDermott (2011) tested the difference between high- and low-performing firms and found that high-performing firms show higher scores in quality performance. Prester (2013) also examined different practices in lower and higher performers and found the biggest differences in the adoption of QM practices, statistical process control, supplier certification and ISO 9001. High performers develop QM practices to a greater extent than lower performers, and then if lower performers want to catch up with the best performers, QM practices could be one way to help them to improve their performance. These ideas suggest that organizations with good financial performance can allocate more resources to develop QM practices. In other words, financial performance may influence QM (Dick et al. 2008).

This may be explained by a selection effect, that is, an ex-ante selection mechanism where better performing firms have a greater propensity to carry out quality practices. To the best of our knowledge, there have been no studies on the selection effect in the hotel industry, and based on the previous reasoning, we propose the following hypothesis:

H5 The better the business performance, the higher the level of quality management.

3 Methods

3.1 Population and sample

The target population for this study was 3- to 5-star individual hotel establishments, including independent and chain-affiliated hotels, located in Spain. Spain ranks

second in the world in terms of international tourism revenue and fourth in volume (UNWTO 2013). The census was achieved from the Hostelmarket Database. The size of the population is 4770 hotels (2417 3-star hotels; 2063 4-star; and 290 5-star).

A structured questionnaire with closed questions was sent by post in two waves to the whole population between October 2011 and February 2012. A pretest was carried out with seven hotel managers, four representatives of hoteliers' associations, one representative of an institute linked to quality issues in the tourism sector and one manager of a consulting firm specializing in hotel management and quality. In the introduction letter of the questionnaire, we indicated that QM questions should be answered by the person responsible for the QM of the hotel, while business performance questions should be answered by the hotel manager. This arrangement was proposed to avoid the common method variance caused by having only one respondent for all questions.

350 hotel managers answered, a 7.34 % response rate. The sampling error is 5.0 % for a confidence level of 95 %, and the least favourable situation of $p = q = 0.5$. 45.07 % of the respondents were 3-star hotels; 47.61 % 4-star establishments and 7.33 % were 5-star hotels. The average size was 128 rooms and 260 beds. 41.6 % were chain affiliated and 58.4 % were independent.

Non-response bias was assessed by comparing early respondents with late respondents (Armstrong and Overton 1977). The rationale is that late respondents are more similar to non-respondents than to early respondents. The dataset was divided into three subsamples according to the number of days from initial mailing until receipt of the returned questionnaire. Pearson's Chi-Square tests and Student's t between the first and last thirds indicated no statistically significant differences in the mean responses for all the variables measured. Therefore, non-response bias is presumed not to be a problem in this dataset. It was additionally found that the number of stars in the sample and the population was significantly related and that there are no significant differences between the number of rooms and beds in the sample and in the population.

In spite of inviting different persons to answer the questionnaire to avoid common method variance, we decided to check this issue. Following Podsakoff and Organ (1986), Harman's single-factor test was applied, which led to the extraction of seven factors, with the first factor accounting for 25 % of the total variance. Therefore, the observed relationships among constructs were not mainly accounted for by the systematic variance associated with the measurement technique.

3.2 Measures

3.2.1 Quality management

The managers had to assess a number of practices within a range of 7 points (from 1, if their establishment had never adopted a given quality practice, to 7, if it always used it). Four dimensions of QM were used: operational systems, information systems, strategic systems and technical systems (see Appendix 1 for the items in the questionnaire). Operational systems measure operative, supplier and people

issues. Information systems measure the analyses of data to improve processes and performance. Strategic systems measure management commitment, planning and customer focus to improve quality. Technical systems include quality tools and techniques. These dimensions and their items are based on Curkovic et al. (2000) and cover the most common QM practices identified by the literature: leadership, planning, information and analysis, people management, customer focus, process management and supplier management (Molina-Azorín et al. 2009; Nair 2006). These practices can be measured in three ways. We can use several items for each practice (e.g. Kim et al. 2012; Sila 2007; Tarí et al. 2007), and we can classify them as soft and hard parts of QM and then use two constructs including a set of items for each one (e.g. Fotopoulos and Psomas 2009; Gadenne and Shama 2009; Naor et al. 2008) or use different constructs following the QM models existing in the market for manufacturing and service organizations as Curkovic et al. (2000) used. In the present paper, we measure QM following the work by Curkovic et al. (2000) adjusting the items to the hotel context.

3.2.2 Hotel guest satisfaction, employee satisfaction and efficiency

The items included in these three scales are based on Curkovic et al. (2000) and Molina-Azorín et al. (2009), and they were measured with a 7-point Likert scale ranging from 1 (no impact) to 7 (very high impact) (see Appendix 2 for the items in the questionnaire). Hotel guest satisfaction measures the effects of QM on hotel guests (complaints, service quality and satisfaction). Employee satisfaction measures the effects of QM on employees (absenteeism, complaints and satisfaction). Efficiency measures the effects of QM on errors, cost of quality and productivity.

3.2.3 Business performance

The present study focuses on performance considered in terms of the operational and financial results measured from primary data and specific to the hotel industry. Four performance variables were measured: occupancy rate per room, average daily rate (ADR), revenues per available room (RevPAR) and gross operative profit per available room (GOPPAR). These variables are suitable for measuring the operational and financial results of individual hotel establishments; they are very commonly used in the literature and are well-known to hotel managers (Sainaghi et al. 2013).

These four variables were measured combining perceptual and objective variables because performance is one of the central concepts of this paper, and it is possible to employ both ways to measure it. In addition, these two ways of measuring permit triangulation of the empirical results. These four business performance variables were measured perceptually employing a Likert scale ranging from 1 to 7 (1 meaning "much worse than competitors" and 7 meaning "much better than competitors") (see Appendix 2).

ADR, RevPAR and GOPPAR were also measured as objective performance using 10 intervals against which hotel managers rated their establishments (see Table 1). These intervals were identified by calculating the minimum, maximum

Table 1 ADR, RevPAR and GOPPAR intervals

Intervals	ADR	RevPAR	GOPPAR
1	Less than 30€/room	Less than 10 €/room	Less than 0€/room
2	From 30to 40€/room	From 10 to 20€/room	From 0 to 10€/room
3	From 41 to 50€/room	From 21 to 30 €/room	From 11 to 20€/room
4	From 51 to 70€/room	From 31 to 40€/room	From 21 to 30€/room
5	From 71 to 100€/room	From 41 to 50€/room	From 31 to 40€/room
6	From 101to 120€/room	From 51 to 70€/room	From 41 to 50€/room
7	From 121 to 150€/room	From 71 to 100€/room	From 51 to 60€/room
8	From 151 to 180€/room	From 101 to 150€/room	From 61 to 70€/room
9	From 181 to 200€/room	From 151 to 200€/room	From 71 to 100€/room
10	More than 200€/room	More than 200€/room	More than 100€/room

and median of these three variables from the following publications: (a) Economic Indicators of the Spanish Hotel Industry provided by Ernst & Young, which includes 600 hotels from 3 to 5 stars; (b) CEHAT (Spanish Confederation of Hotels and Tourist Apartments) HotStats of TRI Hospitality Consulting, which includes 4-to-5-star hotels located in Barcelona, Madrid, Palma de Mallorca, Seville and Valencia and (c) CEHAT Hotel Monitor. Thus, the median value was taken as the central measure and five intervals were constructed below the lowest median value which should include the calculated minimum value, and five intervals above the highest value of which was to include the calculated maximum value. We measured these variables in this way because these were the only objective data to which we had access and also because, as we were told by the practitioners and researchers consulted during the pretest study, it is not advisable to ask directly for these variables, which are commercially sensitive.

In addition, three *descriptive variables* are included in the analysis. These variables are category (measured by number of stars), size (by number of rooms and pax) and chain affiliation (measured by a dichotomous variable; 0 if the hotel is independent or 1 if the hotel is chain affiliated).

The validity and the reliability of perceptual measures were checked as follows. Content validity is assured by an extensive review of the literature and the expert judgment of academics and professionals in the hotel industry. Construct validity was assessed through a factor analysis for each measure (see Appendices 1 and 2). All items which form quality dimensions and performance dimensions converge to one factor except operational systems which converge to two factors (people and process operational systems). As for criterion-related validity, the correlation matrix shows that all the QM systems variables are significantly related ($p < 0.05$) to tourist satisfaction, employee satisfaction and efficiency, which provides evidence of criterion-related validity (Table 2). Finally, reliability is examined using the Cronbach's alpha. The minimum advisable value of 0.7 (Nunnally 1978) is exceeded in every single factor.

Table 2 Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	Mean	S.D.
1. QM. operational systems (people)	1	–	–	–	–	–	–	–	–	–	–	–	4.59	1.64
2. QM. operational systems (process)	0.533***	1	–	–	–	–	–	–	–	–	–	–	5.45	1.27
3. QM. information systems	0.646***	0.667***	1	–	–	–	–	–	–	–	–	–	5.28	1.52
4. QM. strategic systems	0.667***	0.707***	0.855***	1	–	–	–	–	–	–	–	–	5.69	1.27
5. QM. technical systems	0.632***	0.594***	0.788***	0.761***	1	–	–	–	–	–	–	–	5.68	1.53
6. Hotel guest satisfaction	0.474***	0.556***	0.655***	0.716***	0.591***	1	–	–	–	–	–	–	5.59	1.11
7. Employees satisfaction	0.335***	0.424***	0.456***	0.508***	0.312***	0.691***	1	–	–	–	–	–	4.59	1.61
8. Efficiency	0.439***	0.574***	0.642***	0.674***	0.518***	0.846***	0.719***	1	–	–	–	–	5.08	1.22
9. Perceptual performance	0.291***	0.256***	0.277***	0.323***	0.306***	0.369***	0.297***	0.385***	1	–	–	–	4.67	1.07
10. Occupancy rate per room	0.114	0.015	0.101	0.067	0.162**	0.044	−0.031	0.037	0.319***	1	–	–	61.36 %	17.78
11. ADR	0.180**	0.164**	0.172*	0.205***	0.176**	0.142*	0.040	0.135*	0.302***	0.040	1	–	4.68	1.72
12. RevPAR	0.224***	0.195**	0.187**	0.219***	0.211***	0.185**	0.074	0.167**	0.423***	0.395***	0.812***	1	4.71	1.90
13. GOPPAR	0.143*	0.153*	0.066	0.135*	0.118	0.100	0.010	0.102	0.310***	0.206***	0.585***	0.623***	3.88	2.16

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

3.3 Analysis

In order to analyse the association between QM levels, customer and employee satisfaction, efficiency and business performance, two complementary quantitative methods have been used. First, a TwoStep Cluster analysis (Bacher 2000; Everitt et al. 2001; Huang 1998) was applied to obtain QM groups with different levels of QM practice implementation, and then performance differences between them were tested. Second, hotels were classified into two groups considering each performance variable. In this sense, the median of each performance variable was calculated and each hotel was classified as low or high performance. These two analyses allow us to understand the double association between QM levels and performance.

4 Results

Table 3 shows a descriptive analysis of Spanish hotels based on category, chain affiliation and size to contextualise the descriptive information. Table 3 shows that higher category, chain-affiliated and larger hotels are more proactive with QM regarding mainly people, information and technical systems dimensions.

The TwoStep Cluster analysis of the five QM systems was performed in order to identify the different QM levels to test the hypotheses. This analysis shows three

Table 3 Quality management variables profiles by category, chain affiliation and size

	Operative systems (people)	Operative systems (process)	Information systems	Strategic systems	Technical systems
Sample average	4.59	5.45	5.28	5.69	5.68
Category					
3 stars	4.35	5.31	4.93	5.54	5.31
4 stars	4.70	5.49	5.78	5.75	5.90
5 stars	5.29	6.09	6.03	6.18	6.42
F ANOVA	*4.326**	*4.322**	*8.535****	*3.109**	*9.194****
Chain affiliation					
Independent	4.12	5.37	4.94	5.54	5.28
Chain affiliated	5.07	5.54	5.64	5.83	6.10
Student's t	*−5.278****	*−1.171*	*−4.070****	*−1.977**	*−4.938****
Size					
Familiar (≤100 pax)	4.10	5.36	4.86	5.50	5.20
Small (101–150 pax)	4.26	5.66	5.11	5.73	5.70
Medium-sized (151–300 pax)	4.94	5.42	5.47	5.79	5.86
Large (>300 pax)	4.94	5.45	5.64	5.71	6.11
F ANOVA	*6.978****	*0.651*	*5.021***	*0.945*	*6.577****

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

different quality groups with reasonable or strong evidence that there is a cluster structure (0.6 on the indicator proposed by Kaufman and Rousseeuw (2009)). A number of analyses were performed seeking to validate the cluster solution. First, there were significant differences between the three clusters in all the QM practices (see Table 4). Secondly, a discriminant analysis revealed that 97.1 % of the original grouped cases were correctly classified. In other words, the TwoStep Cluster analysis proved to be valid. Accordingly, three QM levels were identified and they must be interpreted to describe the characteristics of the clusters. Table 4 provides the average scores of each group for each variable and the significance test.

Group 1: QM leader hotels. Hotels in this group achieve the maximum scores in each QM system. The maximum scores are achieved in technical and strategic

Table 4 Quality management levels in Spanish hotels

	Average				
	Group 1 leader $n = 225$	Group 2 follower $n = 74$	Group 3 trivial $n = 23$	Total average	Statistics
Quality systems					
Operative systems (people)	5.284	3.523	1.855	4.635	**122.047**[1]***
Operative systems (process)	6.000	4.631	3.188	5.485	**144.486**[1]***
Information systems	6.082	4.054	1.924	5.320	**426.220**[1]***
Strategic systems	6.354	4.641	2.817	5.708	**456.367**[1]***
Technical systems	6.441	4.490	2.457	5.708	**301.837**[1]***
Hotel guest satisfaction	5.970	5.067	3.388	5.597	**107.799**[1]***
Employee satisfaction	4.983	3.972	2.583	4.598	**34.059**[1]***
Efficiency	5.504	4.500	2.800	5.098	**92.691**[1]***
Descriptive variables					
Category[a]	4	4	3	4	**6.695**[2]*
Size (no. Of rooms)	141.55	110.89	86.61	147.21	2.461[1]
Chain affiliation[a]	52 % Independent	66 % Independent	77 % Independent	58 % Independent	**4.020**[2]*
Business performance					
Occupancy rate per room	61.943 %	62.258 %	55.100 %	61.479 %	1.437[1]
ADR 2010	4.87	4.26	4.13	4.69	**4.621**[1]*
RevPAR 2010	4.97	4.18	4.04	4.73	**6.045**[1]**
GOPPAR 2010	3.88	3.80	3.18	3.82	0.907[1]
Perceptual performance	4.863	4.377	4.025	4.700	**9.557**[1]***

[a] Median, [1]F ANOVA, [2]Pearson's Chi-square, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

systems and the minimum in operative systems (people). This group is formed by 225 hotels, that is, approximately 70 % of the sample. This fact means that the QM commitment of hotels located in Spain is high. In addition, the hotels that belong to this group are usually 4-star.

Group 2: QM follower hotels. This group is formed by hotels that achieve scores below the average. Their maximum score is achieved in strategic systems and the minimum in operative systems (people). They represent 23 % of the sample, and they are usually 4-star and independent hotels.

Group 3: QM trivial hotels. This group represents hotels where QM is not a relevant managerial variable. The scores in all QM systems are low achieving the maximum level in operative systems (process) and the minimum in operative systems (people) and information systems. This group represents 7 % of the sample, and it is usually formed of 3-star and independent hotels.

Table 4 shows that there are significant differences between the three groups in hotel guest satisfaction, employee satisfaction and efficiency. The maximum values in these three quality results are achieved by the QM leader group. Therefore, hypotheses 1, 2 and 3 are fully supported. That is, the higher the QM level the better the hotel guest and the employee satisfaction, and the better the efficiency. Regarding business performance, there are significant differences between the three groups in ADR, RevPAR and perceptual performance. The maximum values in these three performance variables are always achieved by QM leader hotels. Therefore, hypothesis 4 (the higher the QM level, the better the business performance) is partially supported.

These findings show that hotels with a lower level of development of QM practices are focused mainly on process dimension, and they do not consider as a daily practice people and information systems. When hotels are more proactive with these practices, they apply more quality techniques and tools, consider quality as a strategic issue and use more data to measure and improve processes, leading to better performance levels.

The final test is whether more profitable hotels develop a more advanced QM system. In this sense, the hotels are classified into two business performance groups, hotels below and above the average on each performance variable. This analysis is interesting because it makes it possible to know whether the most advanced QM is developed by hotels with more financial resources or if this commitment comes from a real conviction from hotel managers about the importance of the QM system. Table 5 shows there are significant differences in all QM systems in RevPAR and in perceptual performance. Regarding ADR and GOPPAR, there are significant differences in four out of the five systems. As for occupancy rate per room, there are significant differences in three out of the five performance variables. These results show that, in general terms, hotels with performance levels above the average develop QM to a greater extent. Therefore, hypothesis 5 (the better the business performance, the higher the level of quality management) is partially supported (i.e. on two out of the five analysed performance variables there are differences in all QM systems, and on three performance variables there are also differences in three or four QM systems).

Table 5 Quality management systems according to business performance level

	Operative systems (people)	Operative systems (process)	Information systems	Strategic systems	Technical systems
Occupancy rate per room					
Below the average	4.400	5.380	5.143	5.585	5.476
Above the average	4.735	5.517	5.463	5.776	5.888
Student's t	***−1.712***†	*−0.889*	***−1.788***†	*−1.235*	***−2.241****
ADR					
Below the average	4.445	5.391	5.160	5.543	5.538
Above the average	4.925	5.592	5.572	6.045	6.015
Student's t	***−2.641******	*−1.348*	***−2.263****	***−3.769*****	***−2.826******
RevPAR					
Below the average	4.384	5.268	5.134	5.507	5.477
Above the average	4.979	5.802	5.671	6.031	6.104
Student's t	***−3.316*****	***−3.759*****	***−3.191******	***−3.817*****	***−3.721*****
GOPPAR					
Below the average	4.406	5.316	5.268	5.599	5.592
Above the average	4.889	5.705	5.559	5.945	6.015
Student's t	***−2.414****	***−2.569****	*−1.628*	***−2.393****	***−2.389****
Perceptual performance					
Below the average	4.329	5.226	5.068	5.435	5.463
Above the average	5.048	5.743	5.639	5.997	6.029
Student's t	***−3.982*****	***−3.533*****	***−3.293*****	***−3.929*****	***−3.240*****

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$

5 Discussion and conclusions

The study found that the hotels with higher QM levels have better hotel guest satisfaction and employee satisfaction, efficiency and better business performance on some dimensions (e.g. RevPAR). Accordingly, an association may exist between QM and hotel guest and employee satisfaction, and efficiency in hotels, and between QM and some business performance dimensions. This means that QM might be one factor among others to explain better performance levels.

QM trivial hotels focus on processes (QM systems process has the higher score in this cluster), and therefore, they try to develop their key processes to fulfil quality

standards for their category and try to develop other QM practices but not so fully. For example, the levels of people and information systems have the lowest scores, indicating that they do not make efforts to instil QM in all employees (for example through training) and they do not use data for continuous improvement. By way of contrast, leader hotels in QM make more effort with people practices (for example, they provide more training for employees and managers), develop more quality tools, use data for continuous improvement and consider quality as a strategic issue and as a way to improve their management system. Similarly, QM follower hotels make a greater effort to develop strategic and process aspects of QM and develop the other QM dimensions to a greater extent than QM trivial hotels. These differences between QM levels show that process control and management could be a first step to develop quality initiatives but only when there is a commitment to increasing quality by adopting more quality tools, using data to improve processes, considering quality as a strategic issue and increasing training and motivation, hotels will increase their performance levels. In addition, it is interesting to note that in QM, "people" system has the lowest score in all the groups, indicating that hotels in each cluster develop people management practices to a lower extent than the other QM systems. This will be an improvement area for hotels in each cluster.

These results support previous studies in manufacturing and service industries showing that organizations develop different levels of QM and that these different levels are associated to different performance levels (Zhao et al. 2004; Lee et al. 2009), extending them to the case of the hotel industry. In addition, these results supplement those studies that find positive effects of QM on performance in hotels (Alonso-Almeida et al. 2012; Nield and Kozak 1999; Wang et al. 2012).

The study also shows that hotels with better performance levels develop QM to a greater extent. For example, in hotels with good performance, it is easier to allocate resources to training activities and use quality techniques and tools (the findings show significant differences in people and technical dimensions of QM on all performance variables). Therefore, in general terms, good performance can facilitate the implementation of certain QM practices. This indicates that a selection effect is possible, supporting previous studies (Heras et al. 2002; Dick et al. 2008). That is, those hotels with better performance levels can implement QM practices more easily because they have available resources to invest in these initiatives. This result is a difference between the present paper and the previous ones because this paper expands the previous studies that examine the effects of QM on performance in service organizations (Alonso-Almeida et al. 2015; Zhao et al. 2004) and in hotels (Nicolau and Sellers 2010; Wang et al. 2012). The present paper supplements these previous studies in service organizations and in hotels showing that a selection effect can also exist.

Both results suggest an association between QM levels and performance, and an association between good performance and QM practices. Although hotels with better performance can invest more resources in quality practices (e.g. quality tools, training, etc.), the development of QM practices can support better performance. Therefore, QM level is one factor explaining better performance in hotels. The contribution of this paper is, first, that it identifies a taxonomy of QM in hotels that

show that the higher the QM level, the higher the level of performance. Second, the paper sheds light on the possible selection effect in the hotel industry.

5.1 Theoretical implications

First, the study has identified a taxonomy of QM using four managerial systems (operative, information, strategic and technical) that could be used to measure QM levels in hotels or other tourism organizations in future studies. Second, the results show that QM levels may have positive effects on performance. This idea suggests that QM practices are one factor among others that explain better performance levels in some hotels. Third, the results also demonstrate that a selection effect is also possible in the hotel industry. This results increase our knowledge about the association between QM and performance showing that a higher performance can be a factor that facilitates the adoption of different management practices such as those related to QM. In this context, as very few studies have examined the selection effect, researchers could continue investigating the ways in which better levels of performance in organizations facilitate the implementation of QM practices. In this respect, this study reinforces previous research about the importance of QM in improving performance and complements these previous works showing that better performing hotels can more easily adopt QM practices.

5.2 Managerial implications

This paper also has implications for hotel managers. First, QM is more developed in hotels with a higher category and more rooms. This result could be due to the fact that this kind of hotel has more resources to invest in improving QM capabilities. Second, the QM scale employed in this study could be used as a check-list to identify strengths and weaknesses regarding the development of QM practices. This may help managers to identify the areas where their implementation has been less effective, so that they would then invest their efforts in those areas in order to increase the QM level in their organizations. In addition, cluster analysis can be used as a guide to identify where the hotel is situated along the improvement spectrum in order to inform decisions about which practices should be reinforced to improve its QM level.

Third, managers should also understand that although good performance facilitates the development of several management practices such as those related to QM, when hotels go beyond the control and management of key activities and consider quality as a strategic tool and use more quality tools, they can achieve even better QM levels. This higher commitment to the quality practices may produce positive results related to efficiency (e.g. they can reduce errors and increase productivity), hotel guest and employee satisfaction (e.g. they can reduce customer and employee complaints, increase hotel guest and employee satisfaction, service quality will be more valued by hotel guests) and business performance (e.g. they can have positive effects on RevPAR).

5.3 Limitations and future research

First, the study has examined the association between QM and performance using a snapshot across a number of hotels. A longitudinal study could extend these results, making it possible to test whether or not hotels with a higher degree of QM achieve significantly better performance levels. In this context, qualitative studies of each QM level, supporting the current quantitative studies, could help in the development of understanding of each level and its association with performance. Second, the research has asked managers if they implement QM practices using perceptual data. Future research could include objective data about QM tools and techniques. Finally, the study has focused on the hotel industry and future studies could be extended to other service industries.

Acknowledgments This work has been carried out as part of the research project ECO2009-12231 funded by the Science and Innovation Ministry (Plan Nacional de I+D+i). The authors thank and acknowledge the support received.

Appendix 1

See Table 6.

Table 6 Quality management (validity and reliability analysis)

Scale items	Factor 1	Factor 2	Commonalities
Operational systems			
1. Quality training courses are offered for all hotel managers and area managers	0.870	0.188	0.792
2. Quality training is offered to all employees	0.911	0.123	0.844
3. Employee motivation is encouraged	0.679	0.381	0.607
4. Quality issues are considered when the services are offered	0.494	0.573	0.573
5. The firm collaborates with intermediaries in order to improve the product offered in the establishment	0.148	0.917	0.862
6. The firm collaborates with suppliers in order to improve the product offered in the establishment	0.220	0.909	0.875
Cronbach's alpha		*0.826*	*0.825*
Eigenvalue per factor		*3.432*	*1.120*
% of variance explained		*57.203*	*18.674*
Correlation matrix determinant		*0.042*	
Kaiser–Meyer–Olkin index		*0.754*	
Barlett's significance test of sphericity		*0.000*	
Information systems			
1. Quality information/data is used in day to day practice in different areas	0.899		0.808
2. Quality information/data is available for all employees	0.875		0.766

Table 6 continued

Scale items	Factor 1	Factor 2	Commonalities
3. Quality information/data is used to improve the quality of the service	0.896		0.803
4. Financial and operational indicators are used to measure quality effects	0.797		0.635
Cronbach's alpha		*0.884*	
Eigenvalue per factor		*3.012*	
% of variance explained		*75.307*	
Correlation matrix determinant		*0.093*	
Kaiser–Meyer–Olkin index		*0.828*	
Barlett's significance test of sphericity		*0.000*	
Strategic systems			
1. Quality policy is formally communicated to all employees		0.830	0.688
2. Quality is highlighted by a well-defined set of policies and procedures		0.871	0.759
3. Required resources are provided to improve quality service		0.846	0.716
4. The needs of customers are used to improve the quality		0.843	0.710
5. Complaints and suggestions from customers are evaluated to improve the service quality		0.801	0.641
Cronbach's alpha		*0.884*	
Eigenvalue per factor		*3.514*	
% of variance explained		*70.275*	
Correlation matrix determinant		*0.039*	
Kaiser–Meyer–Olkin index		*0.784*	
Barlett's significance test of sphericity		*0.000*	
Technical systems			
1. Internal audits are performed		0.748	0.560
2. Satisfaction surveys are conducted		0.844	0.712
3. A complaints and suggestions system is employed		0.858	0.736
4. A system of quality indicators is used for continuous improvement		0.881	0.777
Cronbach's alpha		*0.846*	
Eigenvalue per factor		*2.786*	
% of variance explained		*69.645*	
Correlation matrix determinant		*0.140*	
Kaiser–Meyer–Olkin index		*0.756*	
Barlett's significance test of sphericity		*0.000*	

Appendix 2

See Table 7.

Table 7 Hotel guest and employee satisfaction, efficiency, and perceptual performance (validity and reliability analysis)

Scale items	Factor 1	Commonalities
Hotel guest satisfaction		
1. Reduction in customer complaints	0.865	0.748
2. Increased customer satisfaction	0.894	0.800
3. Increased service quality	0.899	0.809
4. Service is provided faster	0.844	0.712
Cronbach's alpha	*0.897*	
Eigenvalue per factor	*3.068*	
% of variance explained	*76.703*	
Correlation matrix determinant	*0.062*	
Kaiser–Meyer–Olkin index	*0.753*	
Barlett's significance test of sphericity	*0.000*	
Employee satisfaction	0.897	0.805
2. Fewer employee complaints	0.957	0.915
3. Increased employee satisfaction	0.925	0.855
Cronbach's alpha	*0.915*	
Eigenvalue per factor	*2.575*	
% of variance explained	*85.842*	
Correlation matrix determinant	*0.096*	
Kaiser–Meyer–Olkin index	*0.714*	
Barlett's significance test of sphericity	*0.000*	
Efficiency		
1. Fewer service errors	0.872	0.760
2. Lower cost of quality	0.842	0.709
3. Increased productivity	0.851	0.725
Cronbach's alpha	*0.811*	
Eigenvalue per factor	*2.193*	
% of variance explained	*73.114*	
Correlation matrix determinant	*0.035*	
Kaiser–Meyer–Olkin index	*0.714*	
Barlett's significance test of sphericity	*0.000*	
Perceptual performance		
1. Occupancy rate per room	0.730	0.538
2. RevPAR	0.843	0.714
3. GOP	0.931	0.868
4. GOPPAR	0.936	0.876

Table 7 continued

Scale items	Factor 1	Commonalities
Cronbach's alpha	*0.887*	
Eigenvalue per factor	*2.987*	
% of variance explained	*74.663*	
Correlation matrix determinant	*0.042*	
Kaiser–Meyer–Olkin index	*0.748*	
Barlett's significance test of sphericity	*0.000*	

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