



# Quality management benefits through the “soft” and “hard” aspect of TQM in food companies

“Soft” and “hard” aspect of TQM in food companies

431

Evangelos Psomas

*Department of Business Administration of Food and Agricultural Enterprises,  
University of Ioannina, Agrinio, Greece*

Fotis Vouzas

*Business Administration, University of Macedonia, Thessaloniki, Greece, and*

*Dimitrios Kafetzopoulos*

*Department of Business Administration of Food and Agricultural Enterprises,  
University of Ioannina, Agrinio, Greece*

Received 11 February 2013

Revised 15 July 2013

Accepted 25 November 2013

## Abstract

**Purpose** – The purpose of the paper is to examine the binary character of total quality management (TQM) in food companies and to determine the impact of the two aspects of TQM – the “soft” and “hard” – on the quality management benefits.

**Design/methodology/approach** – A research project was carried out in 90 Greek food companies, using the questionnaire method. Two measurement models have been formulated. The first model includes the TQM philosophical elements and quality tools/techniques, while the second model includes the quality management benefits. Exploratory factor analyses are applied to extract the latent factors. The factors that significantly influence the quality management benefits are determined through multiple linear regression analyses.

**Findings** – The analysis of the models confirms the binary character of TQM (the “soft” and “hard” TQM elements) in food companies and the existence of internal and external quality management benefits. The “soft” TQM elements have a significant direct impact on quality improvement, employee benefits and customer satisfaction. However, the impact of the “hard” TQM elements on the above quality management benefits is not direct but indirect, through their significant correlation with the “soft” TQM elements. Finally, quality improvement is also a significant factor that directly influences employee benefits, customer satisfaction and business performance.

**Research limitations/implications** – The small size of the sample of the responding food companies, the diversity of these companies and the subjective character of the data collected are limitations that suggest future research recommendations.

**Practical implications** – Food companies should realize the leading role of the “soft” aspect of TQM and the supporting role of the “hard” aspect in maximizing the quality management benefits and as a consequence in withstanding the current economic downturn.

**Originality/value** – Focusing on “quality-oriented” food companies that have ample experience in quality and food safety management systems, the present study reveals a significant direct impact of the “soft” TQM elements and an indirect impact of the “hard” TQM elements on the quality management benefits.

**Keywords** Food companies, Quality management benefits, Soft and hard TQM elements

**Paper type** Research paper

## Introduction

Quality management is a management philosophy, which has evolved from a rather narrow and mechanistic approach known as statistical quality control introduced by Shewhart, to a more holistic and humanistic approach under the term total quality management (TQM) (Dahlgaard-Park *et al.*, 2001). TQM has spread globally across



---

different industries and sectors (Santos-Vijande and Alvarez-Gonzalez, 2009; Corredor and Goni, 2010). The evidence from the fieldwork of Beardsell and Dale (1999) endorses the view that TQM is suitable for adoption within the food supply and distribution industry. However, according to van der Spiegel *et al.* (2005) and Alsaleh (2007), TQM is the least frequently used quality management strategy in the food manufacturing industry.

In almost all definitions of TQM, two substantial aspects can be identified, which include the “soft” (or “philosophical”) and the “hard” (or “technical”) TQM elements (Dale, 1996; Thiagaragan *et al.*, 2001; Hafeez *et al.*, 2006; Douglas, 2006; Jimenez-Jimenez and Martinez-Costa, 2009; Arumugam *et al.*, 2009). Examples of the “hard” TQM elements include statistical process control and Ishikawa problem-solving tools. The “soft” TQM elements come from leadership, organizational skill and culture, executive commitment, open organization, participative team dynamics and empowerment (Jimenez-Jimenez and Martinez-Costa, 2009).

The purpose of implementing TQM is to provide quality products or services to customers, which will, in turn, increase productivity and decrease costs. As a consequence, company competitiveness and customer satisfaction in the marketplace will be enhanced (Kumar *et al.*, 2011). In other words, if the TQM plan is implemented properly, it positively influences a wide range of areas regarding the internal and external business environment (Abdullah *et al.*, 2008; Kumar *et al.*, 2009; Santos-Vijande and Alvarez-Gonzalez, 2009; Arumugam *et al.*, 2009; Salaheldin, 2009; Corredor and Goni, 2010; Valmohammadi, 2011).

The practical implications of TQM on an increasing range of firms’ operations are receiving growing attention from researchers (Santos-Vijande and Alvarez-Gonzalez, 2009). However, it is difficult to answer the question whether TQM is a terrific quality marvel or a tragic quality malpractice. The answer depends on several factors, for instance, to what type of organization TQM is applied and what definition of TQM is used (Bergquist *et al.*, 2005). This statement underlies the call for more empirical research to clarify how the TQM evolutionary path is related to critical success conditions within an economic sector, industry and era (Idris and Zairi, 2006). The success of the TQM research depends on the development of valid and reliable measures which replicate the actual TQM elements, companies adopt in the real world. Not only should the measurement be consistent within a certain study, but also across many studies (Jitpaiboon and Rao, 2007). According to Oakland (2011), there is a need to improve the common understanding concerning which quality improvement approaches and tools to use in order to support continuous improvement and improve the “quality rating” of companies. Fotopoulos and Psomas (2009a) propose the investigation of the impact of the “soft” and “hard” TQM elements on the quality management benefits in different business sectors.

The present study contributes to the body of literature by focusing on the beneficial effects of the TQM philosophical elements and quality tools/techniques in the food sector. The purpose of the study is to examine the two-dimensional nature of TQM in food companies and to explore the impact of the “soft” and “hard” TQM elements on the quality management benefits. Two measurement models are formulated and tested through exploratory factor analyses (EFA). The first model consists of the “soft” and “hard” TQM elements, while the second one consists of the internal and external quality management benefits. The factors that significantly influence quality management benefits are determined through multiple linear regression analyses.

The rest of the paper is structured as follows: the first part reviews the literature resulting in the formulation of specific research hypotheses. The next part describes the methodology of a research project carried out in food companies. This is followed by the analysis and the respective results. In the next part, the results are discussed and the final conclusions are presented.

## Literature review

### *The “soft” and “hard” TQM elements*

Although there is no consensus on a definition of TQM, there are some underlying, implicit agreements concerning the definition, scope and the core principles and concepts. In other words, despite the many TQM frameworks identified in literature, there are many common elements running through them (Martinez-Lorente *et al.*, 1998). According to Beardsell and Dale (1999), the list of the TQM characteristics identified in the food industry is similar to those in other industries. So, based on an extensive literature review, the following elements are identified as those that constitute the “soft/philosophical” aspect of TQM (Santos-Vijande and Alvarez-Gonzalez, 2009; Arumugam *et al.*, 2009; Fotopoulos and Psomas, 2009a, 2010; Jimenez-Jimenez and Martinez-Costa, 2009; Kumar *et al.*, 2009, 2011; Corredor and Goni, 2010; Tari and Molina-Azorin, 2010; Psomas and Fotopoulos, 2010; Valmohammadi, 2011; Das *et al.*, 2011): top management commitment, strategic quality planning, employee involvement, supplier involvement, customer focus, process focus, continuous improvement, fact-based decision making and human resource development. In addition to the “soft” TQM elements, the quality tools/techniques (Table I) are also identified in the literature as a significant aspect of TQM, namely the “hard” TQM elements (Jimenez-Jimenez and Martinez-Costa, 2009; Fotopoulos and Psomas, 2009b, 2010; Hokoma *et al.*, 2010; Valmohammadi, 2011).

Variables	Factors	
	Hard TQM elements	Soft TQM elements
<i>Kaiser-Meyer-Olkin = 0.909</i>		
	Factor loadings	
Run chart	0.871	
Relations diagram	0.849	
Quality function deployment	0.842	
Failure mode and effect analysis	0.810	
Stem and leaf diagram	0.810	
Control charts	0.810	
Scatter diagram	0.778	
Cause and effect diagram	0.765	
Benchmarking	0.735	
Continuous improvement		0.851
Top management commitment		0.836
Customer focus		0.824
Human resource development		0.820
Fact-based decision making		0.811
Strategic quality planning		0.804
Process focus		0.802
Employee involvement		0.750
Supplier involvement		0.702
Eigenvalue	8.542	3.733
Cumulative variance (%)	47.46	68.19

**Table I.**  
“The soft and hard TQM  
elements” – exploratory  
factor analysis

*Quality management benefits*

The big question for companies regarding the implementation of new strategies such as TQM is often: “will it pay?” (Bergquist *et al.*, 2005). Proponents of TQM consistently insist that a certain set of TQM practices/sub-practices, if correctly implemented, contribute to the success of TQM and thereby lead to high performance (Jitpaiboon and Rao, 2007). According to Oakland (2011), TQM is not just a theory, it is about the achievement of tangible levels of results – in key areas – that are “best in class”, with evidence to provide the confidence that these results can be sustained (through soundly based, systematic and continuously improved business operations and activities). This evidence is not limited to the financial or key results, which demonstrate the outcome of past performance, but also includes results from other stakeholders that serve as leading indicators of future financial/key results performance; measured excellence in customer satisfaction and loyalty, people motivation and capability and the satisfaction of the wider community (Oakland, 2011). So, based on the literature, the following benefits are derived from the implementation of TQM (Kumar *et al.*, 2009, 2011; Fotopoulos and Psomas, 2009a, 2010; Jimenez-Jimenez and Martinez-Costa, 2009; Tari and Molina-Azorin, 2010; Psomas and Fotopoulos, 2010; Das *et al.*, 2011): customer satisfaction, employee satisfaction, the protection of the natural and social environment, quality improvement and improved business performance.

*TQM aspects influencing quality management benefits*

Valmohammadi (2011), using a sample of Iranian manufacturing SMEs, reaches the conclusion that the “soft” TQM practices and quality tools/techniques have a significant impact on organizational performance concerning employee morale, customer satisfaction, profitability, sales growth and market share. Salaheldin (2009) identifies three “soft” critical success factors of TQM implementation in Qatari industrial SMEs, namely, strategic, tactical and operational factors, all of which have a substantial positive effect on operational performance and non-financial performance, which in turn lead to increased financial performance. Das *et al.* (2011), studying manufacturing companies of Thailand, the majority of which belong to the agriculture and food sector, support that companies with high-leadership competencies adopt TQM principles more effectively and consequently are able to produce higher quality products. Trehan and Kapoor (2011), focus on the TQM journey of a major milk-producing cooperative of India. They demonstrate that the project-by-project approach, which is at the heart of the TQM workshop, in conjunction with the basic seven quality control tools, is an excellent approach for building a culture of continuous improvement. More specifically, the TQM workshop results in the following intangible benefits: transformation in attitude of employees, creation of team culture, breakdown of departmental silos and tremendous improvement in labour-management relations. These benefits, in turn, result in tangible financial gains. Psomas and Fotopoulos (2010), using a sample of Greek food companies, determine four latent factors regarding TQM practices (process and data quality management, employee involvement, customer focus and quality practices of top management), and three latent factors regarding quality management benefits (quality improvement and customer satisfaction, which lead to market benefits). Han *et al.* (2009), studying pork processors in eastern China, reach the conclusion that the “soft” TQM elements contribute to overall performance. Alsaleh (2007) focuses on the application of quality tools in the production setups of food processing and manufacturing Saudi companies. The majority of these companies implement quality tools improving all the production stages, from receiving the raw materials to the marketing of the end product.

---

### *Research hypotheses*

Based on the above theoretical background and the research proposals suggested by many authors, the following research hypotheses are formulated:

- RH1.* “Soft” and “hard” TQM elements are detected in the quality management systems (QMS) of food companies.
- RH2.* Quality management benefits regarding customers, employees, society, quality and business performance are detected in food companies.
- RH3.* The “soft” TQM elements have a significant direct impact on the quality management benefits of food companies.
- RH4.* The “hard” TQM elements have a significant direct impact on the quality management benefits of food companies.

### **Research methodology**

#### *Questionnaire*

In order to test the above research hypotheses, a research project was carried out focusing exclusively on the food sector. Based on the philosophical TQM elements, the quality tools/techniques and the quality management benefits identified in the literature, a questionnaire was designed. In order to improve the composition of the questions, a pilot study was carried out in which data were collected from five quality managers of food companies. The questionnaire was also reviewed by quality management academics. Based on their recommendations the syntax of some questions was corrected. The final version of the questionnaire consists of four parts. The first part contains questions regarding the food companies' profiles. The second part contains statements regarding a food company's adoption of the philosophical TQM elements. The third part contains statements regarding the level to which a food company implements the proposed quality tools/techniques. Finally, the fourth part of the questionnaire contains statements regarding the level to which a food company derives quality management benefits with regard to customers, employees, society, quality and business performance. Respondents were asked to indicate the relevance of these statements using a seven-point Likert scale, where 1 represented “strongly disagree” and 7 represented “strongly agree”.

#### *Sample*

The criterion for selecting the companies that would participate in the research project was the certification to ISO 9001, because the requirements of this standard are based on quality management principles which are in line with the TQM philosophy. A list of 485 ISO 9001-certified food companies was created based on data collected from the main certification bodies operating in Greece. The questionnaire was distributed to these companies by e-mail. It was requested that the questionnaire be completed by a senior officer/executive in charge of quality management. A useful sample of 90 respondents was used for further study (response rate 18.6 per cent). No statistically significant differences were detected comparing the responding and non-responding companies, in terms of the number of their employees (Mann-Whitney Test). Furthermore, several non-responding companies stated, when contacted, that the major reason for not participating in the research project was lack of time. Thus, it is apparent that non-response bias is not likely to be an issue in the final sample.

*Method*

EFA is applied in order to extract the latent factors of the TQM elements (first measurement model) and the quality management benefits (second measurement model). The relationships between the extracted latent factors are determined through multiple linear regression analyses. The sample size, the number of the variables used and the ratio of the observations per variables (in each measurement model) are deemed satisfactory, according to Hair *et al.* (2005), for applying the EFA and multiple linear regression analysis. The statistical package SPSS 17 is used for data processing.

**Results***The company profiles*

The majority of the participating food companies in the present study are small and medium-sized enterprises (SMEs). More specifically, 81.5 per cent of them employ less than 250 employees, 9.8 per cent between 250 and 500 employees and 8.7 per cent more than 500 employees. A rate of 80.7 per cent of the responding food companies are manufacturers processors, 8 per cent service providers and 11.3 per cent wholesale traders. Moreover, a rate of 67.4 per cent of the food companies had been certified according to ISO 9001:2000 for at least five years, while a rate of 61.5 per cent had also been certified to ISO 9001:1994. However, all the responding food companies have been implementing the ISO 9001:2008 QMS. Furthermore, almost all the responding food companies have been certified according to ISO 22000 and have ample experience in implementing Hazard Analysis of Critical Control Points (HACCP). Finally, only 25 per cent of the responding food companies did not express the wish to further upgrade their QMS towards TQM.

*EFA of the TQM elements and quality management benefits*

The elements that according to the literature constitute the philosophical aspect of TQM and the quality tools/techniques are used as the basis for the EFA (varimax rotation method). However, in order to guarantee the convergent and discriminant validity, four low loading items ( $<0.5$ ) with respect to quality tools/techniques are excluded from the subsequent data analysis. The result is the establishment of two latent factors by which TQM is analyzed – the “soft” and the “hard” TQM elements (Table I).

Similarly, the measured items of the quality management benefits identified in the literature are used as the basis for the EFA (varimax rotation method). However, in order to guarantee the convergent and discriminant validity, the low loading items ( $<0.5$ ) are excluded from the subsequent data analysis (those regarding society benefits). The result is the establishment of four latent factors into which the quality management benefits are refined. These factors are explained based on the measured items’ loadings and are labelled as follows: “improved business performance”, “quality improvement”, “customer satisfaction” and “employee benefits” (Table II).

From Tables I and II it is obvious that all the factor loadings are above 0.6. Hence, the squared multiple correlations are satisfactorily high. In other words, a high amount of measured variable’s variance is explained by a latent factor. The reliability of the latent factors is confirmed, according to Hair *et al.* (2005), through Cronbach’s  $\alpha$  coefficients (Tables III and IV). The construct validity is confirmed, according to Hair *et al.* (2005), by evaluating the convergent validity (factor loadings  $>0.601$ , average variance extracted  $>0.427$ ), the discriminant validity (average variance extracted  $> \text{Corr}^2$ ), (Tables III and IV), the face-content validity (the questionnaire was developed based on an extensive literature review, a pilot study and review by academics) and the

Variables	Improved business performance	Factors Quality improvement	Customer satisfaction	Employee benefits
<i>Kaiser-Meyer-Olkin</i> = 0.884		Factor loadings		
Market share increase	0.917			
Sales increase	0.905			
Competitiveness improvement	0.846			
Profit increase	0.836			
Performance increase	0.742			
Waste products reduction		0.849		
Reduced defects in final products		0.771		
Reduced defects in semi-final products		0.768		
Non-conformities reduction		0.761		
Customer satisfaction increase			0.813	
Increased number of customers			0.748	
Customer complaints reduction			0.721	
Company retention of loyal customers			0.651	
Company participation in social activities			0.606	
Reduced rate of employee change				0.696
Increased productivity of employees				0.659
Reduced absence without leave				0.601
Eigenvalue	8.439	2.362	1.322	1.124
Cumulative variance (%)	46.88	60.01	67.35	73.59

**Table II.** “Quality management benefits” – exploratory factor analysis

Latent factors	Mean value <sup>a</sup>	Cronbach $\alpha$	Average variance extracted (AVE) <sup>b</sup>	Corr <sup>2c</sup>
Soft TQM elements	5.726	0.934	0.642	0.156
Hard TQM elements	2.658	0.940	0.654	

**Notes:** <sup>a</sup>1 represents “strongly disagree” and 7 represents “strongly agree”; <sup>b</sup>AVE =  $\sum \lambda_i^2/n$  (number of items  $i = 1, \dots, n$ ,  $\lambda_i$  = factor loading); <sup>c</sup>Corr<sup>2</sup> = the squared correlation between the latent factors

**Table III.** The “soft” and “hard” TQM elements – model reliability and validity

Latent factors	Mean value <sup>a</sup>	Cronbach $\alpha$	Average variance extracted (AVE) <sup>b</sup>	Corr <sup>2c</sup>
Improved business performance	5.518	0.934	0.725	0.283
Quality improvement	5.747	0.924	0.621	0.373
Customer satisfaction	5.638	0.841	0.506	0.373
Employee benefits	5.593	0.611	0.427	0.315

**Notes:** <sup>a</sup>1 represents “strongly disagree” and 7 represents “strongly agree”; <sup>b</sup>AVE =  $\sum \lambda_i^2/n$  (number of items  $i = 1, \dots, n$ ,  $\lambda_i$  = factor loading); <sup>c</sup>Corr<sup>2</sup> = the highest squared correlation between the factor of interest and the remaining factors

**Table IV.** “Quality management benefits” – model reliability and validity

nomological validity (significant correlations between the latent factors). Based on the mean values of the latent factors (Tables III and IV), it is obvious that the sample food companies adopt the “soft” TQM elements to a high extent, in contrast to the “hard” TQM elements that are implemented to a lesser extent, and that all the quality management benefits are derived to the same high degree.

*The impact of the “soft” and “hard” TQM elements on the food companies’ quality management benefits*

Having as a dependent variable each of the four latent factors of the quality management benefits, four multiple linear regression analyses are conducted. Based on the sum of the respective measured items, summated scales were calculated for each independent and dependent variable (latent factors) of the regression analyses. Using the standardized and studentized residuals, the assumptions required for each regression analysis were tested and more specifically the linearity, homoscedasticity, independence and normality. Based on the recommendations of Hair *et al.* (2005), specific tests were carried out for each assumption to check for violations. According to the results, these assumptions are not violated and this is the case for each regression analysis. Finally, the multicollinearity among the independent variables of each regression analysis is checked and not confirmed.

According to the results of the first regression analysis, “quality improvement” is directly affected only by the “soft” TQM elements. The “hard” TQM elements do not directly affect “quality improvement”. The results of the second regression analysis show that “employee benefits” is directly affected by the “soft” TQM elements and “quality improvement”. By contrast, the “hard” TQM elements, do not directly affect “employee benefits”. The results of the third regression analysis show that “customer satisfaction” is directly affected by the “soft” TQM elements and “quality improvement”. By contrast, the “hard” TQM elements and “employee benefits”, do not directly affect “customer satisfaction”. The impact of “employee benefits” on “customer satisfaction” is indirect through the significant correlation between “employee benefits” and “quality improvement” (significant correlation at 0.01 level, coefficient = 0.561). Finally, according to the results of the fourth regression analysis, “business performance” is only directly affected by “quality improvement”. By contrast, the “soft” and “hard” TQM elements, “employee benefits” and “customer satisfaction” do not directly affect “business performance”. The impact of these independent variables (excluding the hard aspect of TQM) on “business performance” can be considered as indirect through their significant correlations with “quality improvement” (significant correlations at 0.01 level, coefficients range between 0.5 and 0.61).

Although the “hard” TQM elements have no direct impact on “quality improvement”, “employee benefits”, “customer satisfaction” and “business performance”, the study findings show that the “hard” aspect of TQM has in fact an indirect impact on all the above quality management benefits, through its significant correlation with the “soft” aspect of TQM (significant correlation at 0.01 level, coefficient = 0.395).

### **Discussion**

The majority of the food companies participating in the present study are manufacturing SMEs. Fotopoulos *et al.* (2010) also study ISO 9001-certified Greek food companies, the majority of which are manufacturing SMEs. Moreover, the Greek manufacturing companies in general are SMEs (Panigyrakis *et al.*, 2009). Based



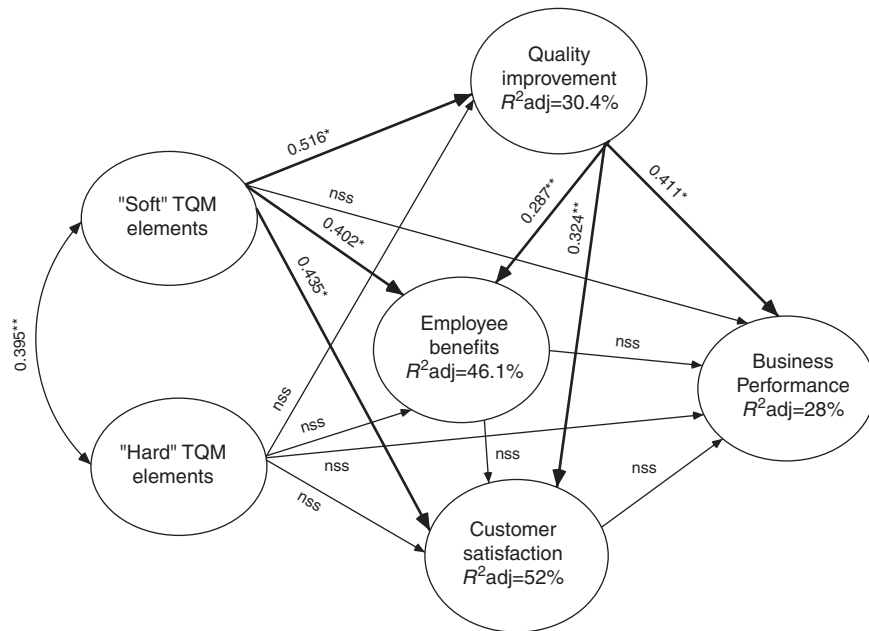
on the results of the present study, it is apparent that the small-medium size did not discourage the Greek food companies from updating their traditional management systems and moving towards quality-oriented management systems. Not only have they been implementing the ISO 9001 QMS, including the old and the revised versions, but they have also been implementing food safety management systems (e.g. HACCP, ISO 22000). It is worth noting that the sample food companies have ample experience in quality and safety management systems. This is in line with the findings of Psomas and Fotopoulos (2010) concerning Greek food companies. Furthermore, the willingness of the sample food companies to further upgrade their management systems towards total quality, confirms the notion that this sector can be characterized as “quality” oriented.

Similarly, Alsaleh (2007), studying the Saudi food industry, find signs of a higher level of quality assurance than expected. Given the enthusiasm of those companies for attaining internationally recognized quality awards and their willingness to implement more advanced quality procedures and tools in the future (as is also the case in the present study), he reaches the conclusion that the future of companies belonging to the food industry is encouraging. The continuing importance of, and reliance upon, quality standards, as is shown by the food companies participating in the present study, is also illustrated in the survey of Drew and Healy (2006).

In exploring quality management in the food companies, the binary character of TQM is confirmed. The existence of two aspects of TQM – the “soft” and “hard” – is evident in the QMS of the food companies, thus supporting the first research hypothesis. Moreover, exploring the nature of the quality management benefits, four latent factors are revealed, namely quality improvement, employee benefits, customer satisfaction and improved business performance. Thus, the second research hypothesis is partly accepted. From the above mentioned benefits, quality improvement and employee satisfaction concern the internal business environment, while customer satisfaction concerns the external business environment. Business performance improvement concerns the external business performance (e.g. market performance) as well as the internal business environment (e.g. operational performance).

Having analyzed the TQM concept and the quality management benefits, the next step is to portray, based on the literature, the interrelationships between the “soft” and “hard” TQM elements and the respective benefits. In doing so, the objective is to determine the significant relationships between the TQM elements and the benefits derived (Figure 1). According to the results, two factors significantly and directly influence the quality management benefits, namely the “soft” TQM elements and “quality improvement”. However, the role of the “hard” TQM elements should not be underestimated. They also influence the quality management benefits not directly but indirectly, through their significant correlation with the “soft” TQM elements. Thus, the findings support the third research hypothesis, and not the fourth hypothesis. This may be justified due to the supporting role that the quality tools/techniques have in improving processes and product quality (Psomas *et al.*, 2011). This is in line with Oakland’s (2011) statement, according to which controls, systems and techniques are very important in TQM, but they are not the primary requirement. It is more an attitude of mind, based on pride in one’s work and teamwork and requires from the management total commitment, which must then be extended to all employees at all levels and in all departments.

Psomas and Fotopoulos (2010), studying food companies, find that, in agreement with the present study, quality management benefits are derived (excluding “employee benefits”) through implementing TQM practices which partly reflect the “soft”



**Figure 1.**  
Relations between  
the latent factors

**Notes:** nss, Not statistically significant; \*,\*\*statistically significant regression weights in  $p=0.001$  and  $0.01$ , respectively

TQM aspect. Similarly, Han *et al.* (2009), focusing on the food sector, find that the attention to quality management elements that partly represent the “soft” aspect of TQM, turn out to be critical in deriving two out of four quality management benefits detected in the present study (those regarding customer satisfaction and business performance). The studies mentioned above as well as the present study focus on food companies the majority of which are manufacturing SMEs, however, the present study differs from those studies by focusing on elements that fully depict both aspects of TQM (the “soft” and “hard”).

The results from study of Abdullah *et al.* (2008) (in electrical/electronic sector) and the present study (in the food sector) are similar. More specifically, the “soft” TQM elements have a significant impact on quality improvement and also a considerable positive effect on employee benefits. Bayazit (2003) state that both the “soft” and “hard” TQM elements are the main factors that contribute to the success of TQM efforts, while in the present study the “hard” aspect of TQM is shown to be indirectly significant. Contrary to the present study that focuses exclusively on food companies the majority of which are SMEs, Bayazit (2003) focuses on large companies belonging to the manufacturing sector in general. However, the findings from both studies regarding the quality management benefits are the same.

Although the study of Santos-Vijande and Alvarez-Gonzalez (2009) focuses on several manufacturing and service firms, contrary to the present study, both studies reach almost the same conclusion. More specifically, based only on the “soft” TQM elements, unlike the present study that is based on both TQM aspects, Santos-Vijande and Alvarez-Gonzalez (2009) reach the conclusion that TQM is adequate for attaining better market-targeted results dismissing any fears of the possible tendency of quality

management to look only inwards (e.g. internal processes improvement). Jung *et al.* (2009) study multinational manufacturing and service industries from different sectors, contrary to the present study that focuses on a particular sector. The findings from both studies show that the “human resource-based” TQM elements have a stronger influence on the improvement of the internal business performance, than the “technology-based” TQM elements.

### Conclusions

Both the “soft” and “hard” TQM elements are detected in the management systems of the food companies. Thus, quality management benefits are derived such as quality improvement, employee benefits, customer satisfaction and improved business performance. According to the framework that was created based on the significant relationships between the TQM elements and the quality management benefits, the optimization of “business performance” is achieved through “quality improvement”. Furthermore, the optimization of “employee benefits” and “customer satisfaction” is achieved through the “soft” TQM elements and “quality improvement”. Finally, “quality improvement” is a factor that is significantly influenced by the “soft” TQM elements. On the other hand, the “hard” TQM elements do not show any direct impact on all the above quality management benefits, they do, however, have an indirect impact, because these TQM elements are strongly correlated with the “soft” TQM elements.

Managers of food companies should realize the importance of the binary character of TQM and more specifically the leading role of the “soft” aspect of TQM and the supporting role of the “hard” aspect in implementing TQM and deriving benefits. A food company operating in an unpredictable crisis dominated in business environment such as Greece, can derive significant quality management benefits through the “soft” and “hard” TQM elements and consequently overcome any difficulty arising from the domestic and international financial market.

This study suffers from some limitations. The small size of the sample of the responding food companies, the diversity of these companies and the subjective character of the data collected are limitations that suggest future research recommendations.

### References

- Abdullah, M.M.B., Uli, J. and Tari, J.J. (2008), “The influence of soft factors on quality improvement and performance. Perceptions from managers”, *The TQM Journal*, Vol. 20 No. 5, pp. 436-452.
- Alsaleh, N.A. (2007), “Application of quality tools by the Saudi food industry”, *The TQM Magazine*, Vol. 19 No. 2, pp. 150-161.
- Arumugam, V., Chang, H.W., Ooi, K.B. and Teh, P.L. (2009), “Self-assessment of TQM practices: a case analysis”, *The TQM Journal*, Vol. 21 No. 1, pp. 46-58.
- Bayazit, O. (2003), “Total quality management (TQM) practices in Turkish manufacturing organizations”, *The TQM Magazine*, Vol. 15 No. 5, pp. 345-350.
- Beardsell, M.L. and Dale, B.G. (1999), “The relevance of total quality management in the food supply and distribution industry: a study”, *British Food Journal*, Vol. 101 No. 3, pp. 190-200.
- Bergquist, B., Fredriksson, M. and Svensson, M. (2005), “TQM: terrific quality marvel or tragic quality malpractice?”, *The TQM Magazine*, Vol. 17 No. 4, pp. 309-321.

- Corredor, P. and Goni, S. (2010), "Quality awards and performance: is there a relationship?", *The TQM Journal*, Vol. 22 No. 5, pp. 529-538.
- Dahlgaard-Park, S.M., Bergman, B. and Hellgren, B. (2001), "Reflection on TQM for the new millennium (1)", in Sinha, M. (Ed.), *The Best on Quality*, Vol. 12, ASQ Quality Press, Milwaukee, WI, pp. 279-311.
- Dale, B.G. (1996), "Sustaining a process of continuous improvement: definition and key factors", *The TQM Magazine*, Vol. 8 No. 2, pp. 49-51.
- Das, A., Kumar, V. and Kumar, U. (2011), "The role of leadership competencies for implementing TQM. An empirical study in Thai manufacturing industry", *International Journal of Quality and Reliability Management*, Vol. 28 No. 2, pp. 195-219.
- Douglas, A. (2006), "TQM is alive and well", *The TQM Magazine*, Vol. 18 No. 1, available at: [www.emeraldinsight.com/journals.htm?issn=0954-478x&volume=18&articleid=1537441&show=html](http://www.emeraldinsight.com/journals.htm?issn=0954-478x&volume=18&articleid=1537441&show=html)
- Drew, E. and Healy, C. (2006), "Quality management approaches in Irish organizations", *The TQM Magazine*, Vol. 18 No. 4, pp. 358-371.
- Fotopoulos, C. and Psomas, E. (2009a), "The impact of soft and hard TQM elements on quality management results", *International Journal of Quality and Reliability Management*, Vol. 26 No. 2, pp. 150-163.
- Fotopoulos, C. and Psomas, E. (2009b), "The use of quality management tools and techniques in ISO 9001:2000 certified companies: the Greek case", *International Journal of Productivity and Performance Management*, Vol. 58 No. 6, pp. 564-580.
- Fotopoulos, C. and Psomas, E. (2010), "The structural relationships between TQM factors and organizational performance", *The TQM Journal*, Vol. 22 No. 5, pp. 539-552.
- Fotopoulos, C., Psomas, E. and Vouzas, F. (2010), "ISO 9001:2000 implementation in the Greek food sector", *The TQM Journal*, Vol. 22 No. 2, pp. 129-142.
- Hafeez, K., Malak, N. and Abdelmeguid, H. (2006), "A framework for TQM to achieve business excellence", *Total Quality Management*, Vol. 17 No. 9, pp. 1213-1229.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2005), *Multivariate Data Analysis*, 6th ed., Pearson Prentice Hall, Upper Saddle River, NJ.
- Han, J., Trienekens, J.H. and Omta, S.W.F. (2009), "Integrated information and logistics management, quality management and firm performance of pork processing industry in China", *British Food Journal*, Vol. 111 No. 1, pp. 9-25.
- Hokoma, R.A., Khan, M.K. and Hussain, K. (2010), "The present status of quality and manufacturing management techniques and philosophies within the Libyan iron and steel industry", *The TQM Journal*, Vol. 22 No. 2, pp. 209-221.
- Idris, M.A. and Zairi, M. (2006), "Sustaining TQM: a synthesis of literature and proposed research framework", *Total Quality Management*, Vol. 17 No. 9, pp. 1245-1260.
- Jimenez-Jimenez, D. and Martinez-Costa, M. (2009), "The performance effect of HRM and TQM: a study in Spanish organizations", *International Journal of Operations and Production Management*, Vol. 29 No. 12, pp. 1266-1289.
- Jitpaiboon, T. and Rao, S.S. (2007), "A meta-analysis of quality measures in manufacturing system", *International Journal of Quality and Reliability Management*, Vol. 24 No. 1, pp. 78-102.
- Jung, J.Y., Wang, Y.J. and Wu, S. (2009), "Competitive strategy, TQM practice, and continuous improvement of international project management. A contingency study", *International Journal of Quality and Reliability Management*, Vol. 26 No. 2, pp. 164-183.
- Kumar, R., Garg, D. and Garg, T.K. (2011), "TQM success factors in north Indian manufacturing and service industries", *The TQM Journal*, Vol. 23 No. 1, pp. 36-46.

- Kumar, V., Choisine, F., Grosbois, D. and Kumar, U. (2009), “Impact of TQM on company’s performance”, *International Journal of Quality and Reliability Management*, Vol. 26 No. 1, pp. 23-37.
- Martinez-Lorente, A.R., Dewhurst, F. and Dale, B.G. (1998), “Total quality management: origins and evolution of the term”, *The TQM Magazine*, Vol. 10 No. 5, pp. 378-386.
- Oakland, J. (2011), “Leadership and policy deployment: the backbone of TQM”, *Total Quality Management and Business Excellence*, Vol. 22 No. 5, pp. 517-534.
- Panigyrakis, G., Kapareliotis, I. and Ventoura, Z. (2009), “Marketing and corporate profitability: the case of Greek firms”, *Managerial Finance*, Vol. 35 No. 11, pp. 909-917.
- Psomas, E. and Fotopoulos, C. (2010), “Total quality management practices and results in food companies”, *International Journal of Productivity and Performance Management*, Vol. 59 No. 7, pp. 668-687.
- Psomas, E., Fotopoulos, C. and Kafetzopoulos, D. (2011), “Core process management practices, quality tools and quality improvement in ISO 9001 certified manufacturing companies”, *Business Process Management Journal*, Vol. 17 No. 3, pp. 437-460.
- Salaheldin, S.I. (2009), “Critical success factors for TQM implementation and their impact on performance of SMEs”, *International Journal of Productivity and Performance Management*, Vol. 58 No. 3, pp. 215-237.
- Santos-Vijande, M.L. and Alvarez-Gonzalez, L.I. (2009), “TQM’s contribution to marketing implementation and firm’s competitiveness”, *Total Quality Management and Business Excellence*, Vol. 20 No. 2, pp. 171-196.
- Tari, J.J. and Molina-Azorin, J.F. (2010), “Integration of quality management and environmental management systems. Similarities and the role of the EFQM model”, *The TQM Journal*, Vol. 22 No. 6, pp. 687-701.
- Thiagaragan, T., Zairi, M. and Dale, B.G. (2001), “A proposed model of TQM implementation based on an empirical study of Malaysian industry”, *International Journal of Quality and Reliability Management*, Vol. 18 No. 3, pp. 289-306.
- Trehan, M. and Kapoor, V. (2011), “TQM journey of an Indian milk-producing cooperative”, *The TQM Journal*, Vol. 23 No. 4, pp. 423-434.
- Valmohammadi, C. (2011), “The impact of TQM implementation on the organizational performance of Iranian manufacturing SMEs”, *The TQM Journal*, Vol. 23 No. 5, pp. 496-509.
- van der Spiegel, M., Luning, P.A., Ziggers, G.W. and Jongen, W.M.F. (2005), “Development of the instrument IMAQE-food to measure effectiveness of quality management”, *International Journal of Quality and Reliability Management*, Vol. 22 No. 3, pp. 234-255.

### About the authors

Dr Evangelos Psomas is a Lecturer at the Department of Business Administration of Food and Agricultural Enterprises in the University of Patras. He received a PhD in Total Quality Management at the University of Ioannina, Greece, in 2008. He has dealt with issues of Management and Marketing and has worked as a Teaching Assistant in the University of Ioannina and Technological Educational Institute of Epirus. His research interests include: total quality management, quality assurance, food safety management, human resource management, supply chain management, agribusiness and food marketing. Dr Evangelos Psomas is the corresponding author and can be contacted at: [epsomas@cc.uoi.gr](mailto:epsomas@cc.uoi.gr)

Dr Fotis Vouzas is an Assistant Professor in the Department of Business Administration in the University of Macedonia, Greece. Studies include BA in Management (Greece), MBA in Management and Organizational Behaviour, MSc in Technology Management (USA) and

---

TQM  
26,5

Doctorate from the University of Macedonia (Greece). Vouzas is a Senior Researcher at Lancaster University (UK) in part of the European Union Research Project Human Capital and Mobility Programme. Participant in various European Union projects ADAPT, TEMPUS specialised in TQM-related issues. Current research interests on TQM-HR relationship, quality assurance, logistics, business excellence and managerial effectiveness. Research work published on domestic and international journals and in a collective book.

444

---

Dr Dimitrios Kafetzopoulos is a Research Assistant in the Department of Business Administration of Food and Agricultural Enterprises in the University of Patras. His research interests include: quality management, quality assurance, food safety management.