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Relationships among TQM Practices and Performance, considering the influences of the Culture, the Industrial Sector and the Size of the Firms

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Abstract

The purpose of this study was to propose a model for understanding the relationships among the Total Quality Management (TQM) Practices and the Performance, considering the culture, the industrial sector and the size of the firms. After the evaluation of the proposed model in a specific developing country, some conclusions were the following: (a) TQM Practices had a significant relationship with the operational performance of the private firms, but not for all types of firms, (b) TQM practices which were most related with the operational performance of firms which produced services: (i) in small firms were: the training of the workers, the management commitment, and the customer focus, (ii) in medium firms were: quality management of providers, product design, and the management commitment, and (iii) in the big firms were: product design, management commitment and customer focus, and c) TQM practices which were most related to the operational performance in medium and big firms were: customer focus, product design and training of workers. Finally, some topics were suggested for future researches.

Keywords: Total Quality Management, TQM, Performance, Culture, Industrial Sector, Size

Introduction

Homaid, Minai, and Rahman (2015) explained that “in successful TQM implementation, several principles of TQM are included such as management and leadership, customer focus, strategic planning, training, continuous improvement, benchmarking and quality culture.” (p. 216). In respect, Total Quality Management (TQM) is a widely adopted management philosophy aimed at improving the operating and business performance of organizations. TQM offers a systematic approach for improving operating activities continually in such a way that a firm fulfills both internal and external customers’ requirements, thus involving everyone in the organization (Agus, 2005; Arumugam, Ooi, & Fong, 2008; Douglas, 2006; Powell, 1995). From its beginnings during the 1950s in Japan, the TQM approach has had followers and detractors with different positions about whether TQM produces improvements in business performance. Contemporary research continues to reflect opposing positions. There are researchers who found a positive relationship between TQM and business performance (Hendricks & Singhal, 2005). Also, there are researchers who indicated that the emphasis on documentation and process management rather than the results that should come with TQM implementation, generated higher costs than perceived benefits (Chin & Pun, 2002; Powell, 1995).

The focus on quality, which offers improvements in business performance, grants a special attractiveness to TQM, contributing to its diffusion around the world. However, Huq (2005) reported that the majority of firms that have implemented a TQM program report marginal or no tangible improvement in productivity, competitiveness, or financial returns. Furthermore, research about the implementation of TQM systems in the USA showed that, until 1993, only one third of the organizations using TQM reported benefits associated with the implementation of TQM (Ahire, Waller, & Golhar, 1996). Failure in the implementation of TQM could be attributed to several causes, such as: lack of relevant measures, the cost of quality, poor initial planning, and high levels of employee turnover (Idris & Zairi, 2006). Other reasons could be the expectation of quick results, the inability to fit quality into organizational goals or the bureaucratization of quality efforts (Yavas

& Rezayat, 2003). Still another reason for the failure may be due to problems derived from employees' resistance, which is affected by the salary received, the level of education and skills possessed, or the working conditions enjoyed and the methods used by employees (Mann & Kehoe, 1995). Furthermore, Boaden (1997) suggested that TQM would have different manifestations in different contexts and sectors in organizations of different sizes. Thus, the lack of results positively correlating TQM with business performance could be attributed to poor design or to not considering certain variables as relevant for the success of implementation, such as the culture and the structure of the firm (Tata & Prasad, 1998).

Given the importance that performance improvement represents to firms, empirical studies that analyze the relationship between TQM implementation and business performance are required (Agus, 2005). Most of the studies published; however, had lacked of scientific rigor (Escrig, 2004; Fuentes, Lloréns, & Molina, 2006; Powell, 1995), and did not consider the influence of important variables such as industrial sector (Brah et al., 2000; Rumelt, 1991; Woon, 2000), firm size (Ghobadian & Gallear, 1996), or national culture (Chin & Pun, 2002; Noronha, 2002b), thus constraining the validity of the results.

Background of the Problem

Despite TQM pioneers, such as Deming, Juran, and Crosby, defined TQM principles and the use of the principles in all types of organizations, additional variables may influence the obtained results when implementing TQM. The industrial sector to which a firm belongs may have relevance for the emphasis put on some TQM practices (TQMP) because the tools and techniques associated with the practices were developed first for the manufacturing sector, and the concept of TQM is disseminated more among manufacturing firms than among service firms (Brah et al., 2000; Prajogo, 2005). Differences between service and manufacturing firms could help explain the variation in the perceptions of organizations' performances.

Chin and Pun (2002) indicated that a creative and flexible work atmosphere, is present in firms of the service sector, and influences the yield of quality practices, suggesting that industrial sector is an important moderating variable for achieving the appropriate development of activities related to TQM. Another variable that may be relevant for the analysis of the relationship between TQM and operating and business performance is firm size. Some studies, such as those conducted by Mann and Kehoe (1995) and Terziovski and Samson (2000), found that the critical success factors for TQM implementation are different for small, medium, and large firms. In addition, Lee (2004) suggested that some benefits obtained from TQM implementation could be more significant to small firms, and Sila (2007) suggested that firm size is a contextual factor that affects the successful implementation of TQM.

Organizational structure becomes more rigid in a firm as it increases its operational volume, leading to increased use of formal procedures in large firms; as such, small firms are usually more flexible (Ghobadian & Gallear, 1997). One of the variables used to define firm size, although not exclusively, is the number of employees; however, no consensus exists about the number that determines when a firm is considered small, medium or large. Also, Yusof and Aspinwall (2000) found evidence to suggest that the critical factors for TQM success in large firms are different to that found in small and medium firms. Other common metrics used to classify firms by size are the assets and sales of a firm (Welsh & White, 1981); however, while it is necessary to use metrics, the objective data is not always available. Also, Powell (1995) studied the impact of TQMP on the operating and the business performance, considering firms with more than 50 employees and concluded that is more probable that large firms will begin TQM programs than will small ones, suggesting that firm size may impede successful TQM implementation.

If firms use different approaches for implementing a TQM system depending on their sizes, TQMP that have impact on operating and business performance would be different for small, medium, and large firms. However, relatively few authors have analyzed the effects of organization size on quality practices (Mady, 2009; Powell, 1995, Terziovski & Samson, 2000; Yavas & Rezayat, 2003). Yavas and Rezayat (2003) considered organization size when they analyzed the differences in perceptions of quality management processes and found that in five out of eight of the processes, large firms showed differences from small firms. Yavas and Rezayat (2003) used 1,000 employees to make the distinction between large and small firms. Differences were found with respect to the following processes: (a) use of statistical control techniques, (b) adhesion to quality standards, (c) commitment of middle managers, (d) relevance of quality techniques workshops, and (e) quality measured by performance. Also, despite few studies that analyzed the influence of national culture on the use of TQMP, the results of studies that have been conducted suggested that TQMP are related to cultural factors because the practices emphasized in different countries are different (Noronha, 2002a; Tata & Prasad, 1998; Yavas & Rezayat, 2003). Noronha (2003) confirmed that replication of a Japanese or American TQM system didn't necessarily lead to success and a system must adapt the technology to each country.

The influence of national culture on TQM was not taken into consideration when the concept was developed. The pioneers of TQM, including Crosby, Deming, Feigenbaum, Ishikawa, and Juran, developed principles for the implementation of TQM in organizations, and each author suggested that the principles could be applied in a prescriptive way due to the universality of the concept (Crosby, 1979; Deming, 1982; Feigenbaum, 1985; Juran & Gryna, 1988). However, Huq (2005) found that the majority of firms that have implemented TQM reported marginal or no tangible improvement. Furthermore, Tata and Prasad (1998) found in a literature review that only between one third and a half of the organizations that implemented a TQM program reported significant improvements on operating or business performance.

Powell (1995) concluded that the quality practices related to operating and business performance in the USA are: (a) management commitment, (b) empowerment and (c) an open culture, which is a concept related to a smaller bureaucracy and employee involvement. The results obtained by Powell (1995) were congruent with those obtained by Samson and Terziovski (1999) whom studied TQMP in firms in Australia and New Zealand, countries that are culturally similar to the USA. Like in the USA, firms in Australia and New Zealand were classified as low in power distance and uncertainty aversion and high in masculinity and individualism. Samson and Terziovski (1999) found that leadership, personnel's management in terms of practices related to human resource management, and customer focus were related positively to operating performance. Personnel management was related to empowerment and employee involvement. Furthermore, Lagrosen (2002) explored cultural differences with respect to TQM implementation and found that the United Kingdom and Germany, countries culturally similar to the USA, Australia and New Zealand, relied on practices focused on employees achieving high quality, whereas in France and Italy, countries culturally opposite to the ones previously mentioned, focused on practices related to the leaders. Two of the TQMP described, empowerment and employee involvement, appeared to be related to national culture. Also, the relationship between TQMP and operating or business performance may be different depending the industrial sector, firm size, and national culture (Boaden, 1997; Tata & Prasad, 1998). Despite the importance given to TQM programs, research about TQMP and their relationships to operating and business performance, taking in account the industrial sector, the firm size and the national culture, has not been conducted in many developing countries.

Theoretical Framework

The proposed model for this study is shown in the figure 1. The details of the concepts associated to the proposed mode are explained in this section.

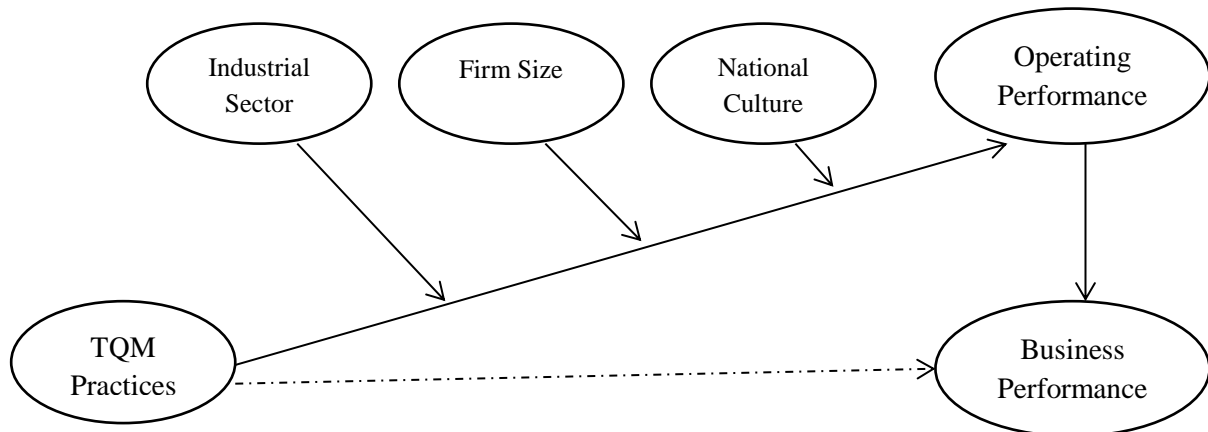


Figure 1. Relationships among TQM practices and operating and business performance.

TQM Practices

TQM is a management philosophy that aims to improve the operating and business performance of organizations through processes of continuous improvement (Agus, 2005; Arumugam et al., 2008; Claver & Tarí, 2008; Douglas, 2006; Krumwiede & Lavelle, 2000; Noronha, 2002a; Powell, 1995; Prajogo, 1995). As such, TQM is composed of principles, models, and practices. Practices are the observable actions that illustrate what the underlying principles are, while principles are the beliefs or dogmas (Boaden, 1997; Powell, 1995).

TQMP are the observable manifestations of the application of TQM principles developed by the pioneers of this concept (Boaden, 1997; Powell, 1995). The models are the conceptual frameworks developed from the principles. Some of the well-known models are ISO 9000:2000, Malcolm Baldrige, Six Sigma, and the excellence model EFQM (European Foundation for Quality Management). Although the principles constitute the deepest and most constant part in this management philosophy, a consensus does not exist on what the TQM principles are and if any of these principles is universal (Nair, 2006; Powell, 1995; Samson & Terziovski, 1999; Zeitz, Johannesson, & Ritchie, 1997).

TQM is a recognized source of competitive advantage and considered one of the major developments in management practice in the last three decades (Cheng, 2007). In respect, Rahman (2001) pointed out that firms, such as Motorola, Ford, Zerox, Federal Express, Procter and Gamble, and others have adopted strategies that took TQM as a guiding principle. Although TQM had its beginnings in the 1950s, it is still widely accepted as an organizational goal for several firms around the world (Pinner, 2003). Also, in several investigations, it was found that TQMP are related not only to operating performance, but also to business performance (e.g. Ahire et al., 1996; Arumugam et al., 2008; Fuentes et al., 2006; Powell, 1995).

Agus (2005), in his study of Malaysian electronic firms, cited several researchers who found a relationship (Agus & Hassan, 2000; Cherkasky, 1992; Opara, 1996; Schaffer & Thompson, 1992). However, other researchers (Agus, Claver-Cortés, Pereira-Moliner, Tarí, & Molina-Azorín, 2008; Demirbag, Tatogly, Tentikus, & Zaim, 2006; Han, Chen, & Ebrahimpour, 2007; Kaynak, 2003) did not find a direct relationship between TQMP and business results, but rather, an indirect

relationship through operating performance. In the present study, the relationship between TQMP and operating and business performance in Peruvian firms is analyzed (Figure 1). It is proposed that a relationship exists between operating and business performance. Thereafter, the relationship between TQMP and organizations' performances is presented, moderating for industrial sector, firm size, and national culture. According to the literature review, TQMP are the following: (a) Management commitment (Ahire et al., 1996; Powell, 1995; Hinkin, 1995; Saraph et al., 1989), (b) Customer focus (Zeitz et al., 1997; Ahire, et al., 1996; Samson & Terziovski, 1999), (c) Suppliers' quality management (Zeitz et al., 1997; Ahire et al., 1996; Saraph et al., 1989; Powell, 1995), (d) Employee training (Ahire et al., 1996), (e) Empowerment (Ahire et al., 1996), (f) Employee involvement (Ahire et al., 1996; Samson & Terziovski, 1999), (g) Continuous improvement (Zeitz et al., 1997; Ghobadian & Gallear, 1996), (h) Information-use-and-analysis (Powell, 1995), and (i) Product/service design (Saraph et al., 1989).

Operating Performance

Homaid, Minai, and Rahman (2015) studied the nature of the linkage among TQM and performance of microfinance banks in Yemen (through a questionnaire survey covering 78 branch managers in 2014), study which revealed the mediating effect of IT capability in that relationship. Also, Psomas and Kafetzopoulos (2014) compared ISO 9001 certified and non-certified manufacturing firms with regard to financial and non-financial performance measures, and found that "The ISO 9001 certified manufacturing firms significantly outperform the non-certified with regard to product quality, customer satisfaction, operational, market and financial performance" (p. 576). Additionally, Psomas and Kafetzopoulos (2014) indicated that "This is evident in a business environment where an economic downturn and financial crisis dominates" (p. 756).

It is important to remark that operating performance refers to results obtained by the firm with respect to product quality or the attention provided to customers (Agus, 2005). The results can be measured by the rate of nonconforming products, customer satisfaction, and percentage of on-time deliveries (Samson & Terziovski, 1999). Business performance refers not only to results obtained in the growth of sales and market share (Agus, 2005) but also by profits (Powell, 1995). Additionally, Yang, Yang and Lee (2015) indicated that "audit firms in different market segments have different performance determinants" (p. 51) and explained that "In addition to the service quality, audit firm size is a critical performance determinant identified by prior studies (Collins-Dodd, Gordon and Smart, 2004; Chen, Chang and Lee, 2008)" (p. 51). Some researchers (Hasan & Kerr, 2003; Hwang & Chen, 2002; Samson & Terziovski, 1999; Powell, 1995) operationalized operating and business performance and developed instruments that measure these constructs. For this study, operating performance was developed using the approaches of Hasan and Kerr (2003) and Jabnoun and Sedrani (2005). The construct used by Powell (1995) was discarded because it referred to the implementation of a formal TQM program. The instrument developed by Samson and Terziovski (1999) used a scale that, although it has five answer options, did not correspond to the Likert-type scale used in the instrument for this study, while Saraph et al. (1989) and Zeitz et al. (1997) did not measure the construct.

Business Performance

García-Bernal and Ramírez-Alesón (2015) explained that evidence in the literature showed that "total quality management (TQM) improves organizational performance, but researchers disagree on why and how such improvements occur and on who really benefits (shareholders, employees, customers, society)" (p. 23); however, their study revealed that "TQM improves operational performance of all stakeholders share the benefits of this improvement" (p. 23), considering: operational performance (improving internal efficiency), financial performance (improving

shareholder performance), customer satisfaction and other stakeholders' performance. Also, Lee and Lee (2015) studied the relationships among the organizational learning (indicators: learning orientation, information orientation and team orientation), the total quality management (indicators: continuous improvement, customer focus, process management, and service culture) and the business performance (indicators: financial performance and non-financial performance). For this purpose, Lee and Lee used 414 effective questionnaires and after the analysis with structural equation modeling, found the following: (a) organizational learning has significant and positive effects on TQM, (b) both organizational learning and TQM have significant and positive effects on business performance, (c) TQM fosters business performance and play a mediating role between organizational learning and business performance.

In this study, the items for business performance construct were taken from the instrument developed by Powell (1995) that measures financial and sales results in the organization. Powell considered that a TQM program showed results after three years of implementation. The questions of Powell (1985) were used in the questionnaire. Several researchers (Delaney & Huselid, 1996; Demirbag et al., 2006; Powell, 1995; Rasheed, 2005) assessed business performance using the perceptions of managers of their organizations' financial results over the previous three years.

TQM detractors suggested that the implementation of TQM required high training costs, absorbed the time of managers, implied high levels of commitment by employees, increased documentation, and emphasized processes instead of results (Chin & Pun, 2002). Furthermore, results obtained by different researchers were contradictory with respect to whether TQMP were related to performance. While some authors claimed that TQM allowed an improvement in operating or business performance (Escrig, 2004; Kaynak, 2003; Samson & Terziovski, 1999; Sun & Cheng, 2002; York & Miree, 2004), other authors reported that only some TQMP were related to operating or business performance (Dow, Samson, & Ford, 1999; Lagrosen, 2002; Nair, 2006; Powell, 1995; Rahman & Bullock, 2005).

Industrial Sector

According to Prajogo (2005), scholars have indicated that due to the different nature of manufacturing and service firms, TQM program implementation would vary between the two types of firms, even to the level that it would not be possible to implement TQM in service firms, at least not in the way conceived initially. Also, the definition of manufacturing and service firms used in this study is based on the definition of Woon (2000), who defined a manufacturing firm as the one that produces mainly tangible goods, devoting a significant part of its operations to the production of such goods. In contrast, a service firm is the firm whose products are mainly intangible. Woon (2000) drew attention to relevance of industrial sector and the importance of separating manufacturing and service firms and described several studies that identified four characteristics that differentiated service firms from manufacturing firms, whose are the following: (a) intangibility of the product, (b) inseparability of the production and consumption, (c) heterogeneity of results, and (d) product perishability. Services are intangible by nature; inseparability refers to the fact that the service takes place and is consumed at the same time, while heterogeneity refers to services being adapted to customers. Finally, perishability indicates that the services cannot be inventoried.

Firm Size

Yang, Yang and Lee (2015) studied the relative importance between service quality and firm size in the performance determinants of audit firms, with empirical data from the 1995-2009 Survey Report of Audit Firms in Taiwan, published by the Financial Supervisory Commission, and concluded that: "Empirical results indicate that service quality is more important than firm size in the performance

determinant of national firms. However, firm size is a more important performance determinant in the regional and local firms.” (p. 62). In respect, Morrow (1997) indicated that the need for having TQM measurements closer to the principles led to inclusion of variables such as the industrial sector and size of organizations; also, concluded that these variables have an impact on the perception about quality practices are related to performance. According to Powell (1995), by 1992, 93% of the 500 largest American organizations had adopted TQM in some form. Powell indicated that large firms implemented TQM programs before medium and small firms; more recently, Pinho (2008) affirmed that small and medium enterprises have been slow at implementing TQM.

Conca, Llopis and Tarí (2002) defined a small firm as being one with less than 50 employees, a medium firm between 50 and 250 employees, and a large firm more than 250 employees. Furthermore, Yusof and Aspinwall (2000) used 250 employees to make the distinction between a large firm and a medium or small firm. Madu, Kuei and Lin (1995), however, used 500 employees to make the distinction between large and medium to small firms, congruent with the Malcolm Baldrige model. Ghobadian and Gallear (1996) used the same classification and concluded that small and medium firms took more time starting TQM programs than did the large firms. Furthermore, Powell (1995), in his study of the relationship between TQMP and operating and business performance, used firms with more than 50 employees and suggested 500 employees as the criterion for considering a firm large.

Regarding the size of the firm, in Peru, a small firm has up to 50 employees (Law of Promotion and Formalization of the Micro and Small Firm, 2003). Dow et al. (1999) also defined small firms as ones that have less than 50 employees, a definition used in the present research. Ghobadian and Gallear (1996) and Powell (1995) considered large firms as those having more than 500 employees. A medium firm has between 50 and 500 employees. Thus, in this study, the number of employees was used to classify small, medium, and large firms.

National Culture

Yavas and Rezayat (2003) conducted an analysis of the effects that national culture had on the perceptions of quality, indicating that in cross-cultural research, two opposed points of view can be identified in the literature: the culturalist school and the rationalist school. The culturalist school emphasizes the country's origins and indicates that management practices are an extension of the traditions of the country and practices are only applicable in that context in such a way that when a transnational firm wants to implement management practices in a subsidiary abroad, the firm should first determine what the practices mean in the destination country. The rationalist school proposed that management practices are rational answers to factors like industrial growth, technology level, and degree of competitiveness. Also, Ouchi (1992) proposed a framework to study culture, dividing the concept in three components: (a) artifacts (the visible part of culture and are the easiest component to analyze because artifacts rest on the surface of the culture concept, such as: language, dress, or symbols, which are used to communicate concepts), (b) models, and (c) values. Also, Schein (1992) proposed a similar framework, calling the three levels: (a) artifacts, (b) declared values, and (c) underlying assumptions (the deepest level).

Hofstede (1991) defined culture as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (p. 5) and established a conceptual framework of five dimensions to describe the culture of a society, whose where the following: (a) power distance, which measures the level of inequality tolerated by society; (b) uncertainty avoidance, which measures the intolerance to ambiguity in the society; (c) masculinity, which measures the importance given to earnings, recognition advancement, and challenge, as opposed to cooperation, security, and the management of good relationships; (d) individualism, which

measures the level of ties among individuals; and (e) long-term orientation. Considering industrial sector, size, and national culture when implementing TQMP may help firms make better decisions about how to implement a system of quality management as well as allow organizations to better use scarce resources and obtain increased profits.

Methodological Design

Statement of the Problem

There was not found a generic model for evaluating the relationships among the Total Quality Management (TQM) Practices and the Performance (operating and business performance), considering the culture, the industrial sector and the size of the firms in developing countries, situation which didn't permit to take in account a theoretical framework for a better understanding of the implementation of international quality standards in the firms of this type of countries.

Purpose of the Study

The purpose of this study was to propose a model for understanding the relationships among the Total Quality Management (TQM) Practices and the Performance (operating and business performance), considering the culture, the industrial sector and the size of the firms in developing countries. Also, this study sought to evaluate the proposed model to a specific developing country.

Population and Sample

Peruvian firms are not using TQM programs widely despite the benefits that firms can obtain with its implementation. From the 906 893 firms registered for the fourth economic census in Peru (Instituto Nacional de Estadística e Informática [INEI], 2008b), by mid 2008, only 581 registered firms had earned an ISO 9001:2000 certification (Centro de Desarrollo Industrial, 2008). For the convenience of data collection, Lima, Arequipa, Cajamarca, Chiclayo, Cusco, Piura, and Trujillo, were included in the present study. The study population is the group of formal firms in the private sector with operations in the mentioned cities. Three groups of firms in the service sector: (a) small firms with fewer than 50 employees, (b) medium firms with between 50 and 500 employees, and (c) large size firms with more than 500 employees; and three groups of manufacturing firms were used in the study. Also, small firms used in this study were those employing fewer than 50 employees. The literature review showed that 91% of firms in the UK, the USA, and Japan have between 1 to 10 employees (Ghobadian & Gallear, 1996); a similar number was expected in Peru.

Middle managers studying one of included MBA programs and working for a private firm were selected to participate in the survey. Only one employee per firm was selected to answer the survey; Sila (2007) also selected only one respondent per firm. Middle managers are familiar with TQMP in their organizations, as well as with the operating and business performance (Madu et al., 1995, Madu et al., 1996). For example, Zeitz et al. (1997) used MBA students in work to develop a questionnaire assessing TQMP. In total, 426 potential participants were identified, 284 from Lima and 142 from other main cities in the country. Only those participants who were in the classroom on the day of data collection were included, and 363 completed questionnaires were obtained; 236 from Lima and 127 from cities outside Lima. Those who did not respond to the questionnaire were students that were absent at the time of data collection, or when the professor called them, they refused to participate. Of the 363 completed questionnaires, 24 questionnaires were eliminated because participants had not answered one or more questions or marked more than one answer to one or more questions. It was assumed that these participants did not know the answers and inclusion of their data would affect the conclusions obtained. Of the remaining 339 completed

questionnaires, 22 participants were from public-owned firms, 13 of which were from cities outside Lima. For the sake of uniformity of the sample, these cases were excluded. Finally, questionnaires filled in incorrectly were excluded. The result was 256 questionnaires for analysis. In no case, a participant didn't understand a question among the 256 valid questionnaires processed; 179 participants were from Lima and 77 from main cities outside Lima, with 166 from the service sector and 90 from the manufacturing sector. Table 1 shows the number of students selected, and the number of the participants.

Table 1
Number of Participants Selected, Participants who Answered, and Size of the Final Sample

Program	N° of participants Selected	N° of participants who answered	Sample size used
Lima	299	236	179
MBAGXVI	47	36	31
MBAGXXI	72	60	46
MBAGXVII	31	22	15
MBAGXIII	22	18	15
MBAGXVIII	19	17	13
MBAGXXIII	41	31	21
MBAGXX	52	40	28
MBAGXIV	15	12	10
Provinces	142	127	77
Arequipa III & IV	23	22	18
Arequipa V	21	20	12
Cajamarca III	4	4	2
Chiclayo IV	17	16	6
Cusco IV	11	7	5
Piura III & IV	17	14	6
Piura V	19	18	12
Trujillo IV	9	7	5
Trujillo V	21	19	11

Hypotheses

In this study, the hypotheses were the following:

- H1: TQM practices are related to operating and business performance
 - H1a: TQM practices are related to operating performance.
 - H1b: TQM practices are related to business performance.
 - H1c: Operating performance is related to business performance.
- H2: The level of use of TQM practices is different in service and manufacturing firms.
- H3: The level of use of TQM is different in small, medium, and large firms.
- H4: TQM practices are related to performance in service firms.
 - H4a: TQM practices are related to performance in small service firms.
 - H4b: TQM practices are related to performance in medium service firms.
 - H4c: TQM practices are related to performance in large service firms.
- H5: TQM practices are related to performance in manufacturing firms.
 - H5a: TQM practices are related to performance in small manufacturing firms.
 - H5b: TQM practices are related to performance in medium manufacturing firms.
 - H5c: TQM practices are related to performance in large manufacturing firms.
- H6: Empowerment is one of the three TQM practices more related to performance.

Variables

The variables which were considered in this study, were the following:

- A. Independent Variables. TQM practices were defined as independent variables: (a) management commitment (MgmCom), which measures the level of importance granted to the activities of quality and the assignment of resources on the part of managers; (b) customer focus (CusFoc), which is the extent to which the firm knows its clients and offers assistance to customer requirements; (c) suppliers' quality management (SupQMa), which involves evaluation, selection and coordination with suppliers; (d) employee training (EmpTr), which measures the training in quality techniques and tools; (e) empowerment (Empow), which is the level of power and autonomy personnel have in decision making; (f) employee involvement (EmpInv), which is employees' commitment to quality activities in the firm; (g) information-use-and-analysis (InfAn), which is the extent to which the firm uses statistical techniques for decision making and problem resolution; and (h) product/service design (ProdDis), which is the care taken when a firm designs and introduces new products in the market.
- B. Dependent Variables: operating performance (OpPer) and business performance (BusPer). Operating performance can be measured by considering customers' satisfaction, firm reputation and the quality level perceived by customers. Business performance is related to financial results. Operationalization of the dependent variables was determined through a review of the literature.
- C. Moderating Variables: industrial sector, firm size, and national culture. For the industrial sector, manufacturing and service firms are considered. With respect to firm size, small, medium, and large firms are classified according to the number of employees. Finally, with respect to national culture, the cultural dimensions of power distance, uncertainty aversion, individualism, and masculinity are considered, as proposed by Hofstede (1991).

Data Collection

The data collection was conducted on the campus of CENTRUM Católica Graduate Business School of Pontificia Universidad Católica del Perú, with MBA students from the Managerial MBA in Lima and the MBA MADEN from the main cities inside Peru, which were the following: Lima, Cajamarca, Chiclayo, Piura, Trujillo, Arequipa and Cusco. From all the students in a class, only those who worked in different firms to the students previously selected were included. This procedure was repeated until students from all classes had been selected. The questionnaire was answered in classrooms within 10 minutes per survey, using part of the normal class time of the professors at the school. Each professor who conducted the survey, received instructions and a list with names of selected participants to complete the questionnaire; if a student did not attend the class or did not want to complete the questionnaire, no registration of his or her name or firm was kept; nor was another student requested to complete the questionnaire.

Results

The data was analyzed using SPSS 15.0 and AMOS 7. The first step was the detection of outliers to find inconsistencies in the completion of the survey. An outlier does not necessarily mean elimination of an answer, but rather, invites an analysis of the answers to find inconsistencies in the completion (Hair, Anderson, Tatham, & Black, 1995). In total, 41 questionnaires were detected with outliers in at least one of the 49 questions for the 10 studied constructs. Cases with outliers were checked one by one, and in all the questionnaires but two, no pattern was detected in the answers, so these 47 questionnaires were considered valid. In the other two cases detected, the respondents marked *totally in agreement* for almost all the answers. A participant who worked for a

large manufacturing firm in Lima answered one of the questionnaires. The other questionnaire was completed in one of the other cities, and the participant worked for a medium-sized service firm. The first analysis conducted was to determine a model that reflected the relationship between the variables, starting from the conceptual framework proposed in the theoretical framework section. Figure 2 illustrates the proposed model; the model has two parts: on one side, the measurement model measures the convergence of TQMP with the latent variable total quality (TotQua); on the other side, the structural relationship between TQMP and operating and business performance is measured. In this model, it is proposed that TQMP have a positive relationship with operating and business performance; in addition, an improvement in operating performance leads to an improvement in business performance. The model was subjected to confirmatory factor analysis to determine its goodness-of-fit index (GFI). A GFI index $> .9$ was considered appropriate (Hair et al., 1995); for root mean square (RMR), which measures the mean value of the residuals between the null model and the model proposed, a value near to zero is considered appropriate; and for the chi-square ratio divided by the degrees of freedom a value < 3 is considered appropriate (Hair et al.). To test the stability of the proposed model, the same tests were conducted by comparing answers from Lima and the other main cities.

The relationship between TQM and business performance was not significant ($p > .1$) in the three cases, while the final model indicated a positive and significant relationship between TQMP and operating performance ($p < .001$), and a positive and significant relationship between operating performance and business performance ($p < .001$). The result is agree with Wolff and Pett (2006), who indicated that product improvement and not process improvement was related to firm growth and performance; the result is also in agreement with the work of Deming (1982), who established that improvement in quality increases productivity, which allows a firm to be more competitive. TQM has an impact on process improvement, and it is through process improvement that results are achieved. Business performance is affected by operating performance, which explains part of its variation; however, no direct relationship between TQM and business performance is evident. All TQMP had a significant relationship with the latent variable that contained them: TotQua. Figure 2 shows the standardized coefficients obtained for the model with the complete sample.

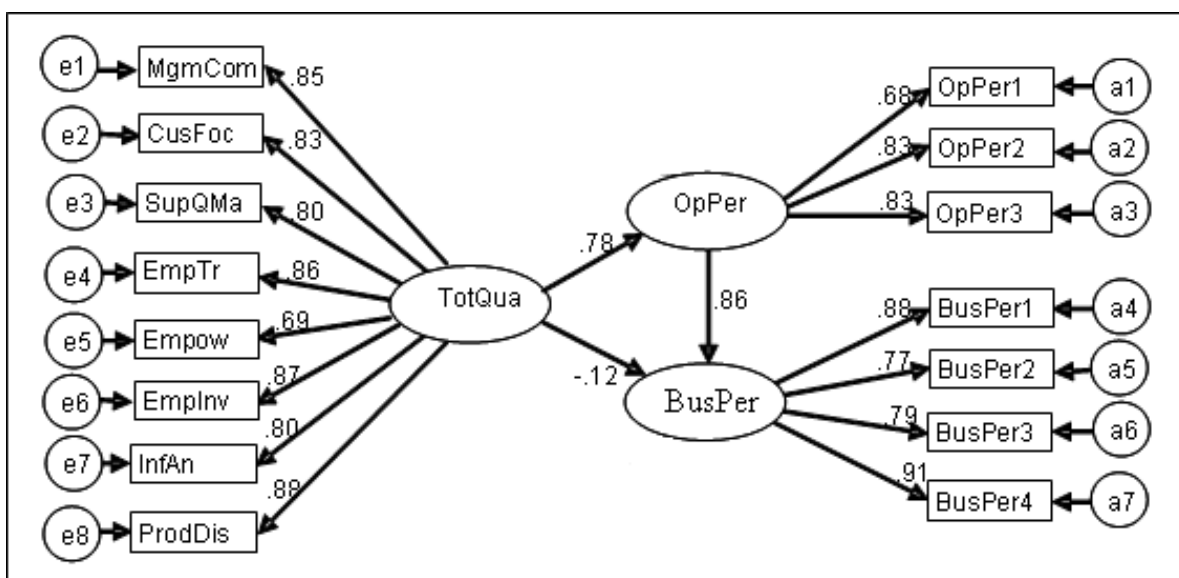


Figure 2. Standardized coefficients for the relationship between TQM and operating and business performance.

Table 2 shows model's non standardized values,, standard error, and critical ratio for each relation. The critical ratio indicates to what extent a value is different from the null model. A critical ratio $>$

2 indicates a significant value for the relation between the variables. Only the relation between the latent variable that contains TQMP and business performance was not significant.

Table 2
Non Standardized Coefficients, Standard Error, and Critical Ratio for the Relationship Among Constructs

Construct	Estimated	Standard Error	Critical Ratio
TotQua to			
MgmCom	.821	.052	15.70
CusFoc	.757	.050	15.17
SupQMa	.757	.052	14.61
EmpTr	.822	.052	15.95
Empow	.591	.049	12.07
EmpInv	.826	.050	16.38
InfAn	1.000		
ProdDis	.731	.044	16.45
OpPer	.844	.074	11.48
BusPer	-.153	.127	-1.20
OpPer to			
BusPer	1.008	.133	7.58
OpPer1	.686	.059	11.61
OpPer2	.888	.060	14.91
OpPer3	1.000		
BusPer to			
BusPer1	.943	.046	20.38
BusPer2	.793	.051	15.63
BusPer3	.724	.044	16.63
BusPer4	1.000		

Note. All coefficients are significant ($p < .001$).

The obtained results supported hypothesis *H1a*: TQMP are related directly and significantly to operating performance. Operating performance is measured with middle managers' perceptions of customer satisfaction, firm reputation, and customers' perceptions toward firm quality. The result shows that an emphasis on TQMP allows a firm to be perceived positively by its customers.

However, the obtained results do not support Hypothesis *H1b*: the relationship between TQMP and business performance is not significant. Studies that find a direct relationship between these constructs do not usually consider the influence of other variables, such as operating performance. It is observed that the correlation between TQM and business performance is significant only when operating performance is not considered in the analysis; when introducing operating performance, however, TQM is significantly related to operating performance and not business performance.

The obtained results supported Hypothesis *H1c*: operating performance is significantly related to business performance. A higher customer satisfaction and good customer perceptions towards the firm's quality level are related positively to improvement of business performance. The results obtained are in agreement with Ghobadian and Gallear (1996), who published empirical research that supported the notion that by focusing on quality, a firm can increase its market share and profitability and that quality perceived by customers and profitability are correlated positively. A firm that improves quality will be able to charge a higher price for products. The use of TQMP should lead firms to improve the quality of their products or services. Consequently, the hypothesis *H1*: TQM practices are related to operating and business performance, was not supported. Also, about the differences between service and manufacturing firms, the level of use of TQMP for each industrial sector was measured. Table 3 shows the mean values and standard deviations obtained for each construct. ANOVA was applied to determine the differences among the mean values for manufacturing and service firms for each construct; the results are shown in Table 4. The differences of the mean values obtained for empowerment ($p < .05$) and information-use-and-analysis are significant ($p < .001$).

Table 3
Level of Use of TQM Practices for Service and Manufacturing Firms

	Service: <i>n</i> = 166		Manufacturing: <i>n</i> = 90	
	<i>X</i>	<i>S.D.</i>	<i>X</i>	<i>S.D.</i>
MgmCom	3.359	.754	3.529	.690
CusFoc	3.480	.679	3.464	.727
SupQMa	3.457	.715	3.537	.714
EmpTr	3.296	.723	3.431	.732
Empow	3.269	.648	3.460	.625
EmpInv	3.346	.699	3.420	.754
InfAn	3.048	.935	3.474	.929
ProdDis	3.600	.639	3.592	.627
OpPer	3.876	.818	3.833	.686
BusPer	3.866	.893	4.078	.810

The result supports hypothesis *H2*: the level of use of TQMP is different in service and manufacturing firms. The largest difference in TQMP between service and manufacturing firms is in information-use-and-analysis, which represents the extent to which firms use graphs and statistical techniques to measure quality performance. Manufacturing firms show a higher-level use of information-use-and-analysis than do service firms. Measurement of quality in the service sector is subjective, which would explain the result. Also, differences in management commitment, although not significant, could be explained by the higher development of quality systems in manufacturing firms, which implies that managers intervene to ensure the continuity of these systems more than in service firms. The results would indicate that middle managers perceive manufacturing firms as more profitable than service firms.

Table 4
ANOVA for the Differences between Means for Industrial Sector

Construct	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
MgmCom				
Between groups	1.684	1	1.684	3.141
Within groups	136.146	254	.536	
CusFoc				
Between groups	.016	1	.016	.033
Within groups	123.069	254	.485	
SupQMa				
Between groups	.375	1	.375	.735
Within groups	129.817	254	.511	
EmpTr				
Between groups	1.059	1	1.059	2.006
Within groups	134.131	254	.528	
Empow				
Between groups	2.136	1	2.136	5.209*
Within groups	104.173	254	.410	
EmpInv				
Between groups	.319	1	.319	.618
Within groups	131.234	254	.517	
InfAn				
Between groups	10.585	1	10.585	12.156***
Within groups	221.165	254	.871	
ProdDis				
Between groups	.004	1	.004	.009
Within groups	102.399	254	.403	
OpPer				
Between groups	.104	1	.104	.173
Within groups	152.149	254	.599	
BusPer				
Between groups	2.618	1	2.618	3.500
Within groups	190.036	254	.748	

Note. * $p < .05$. *** $p < .001$

Manufacturing firms show a higher level for the use of empowerment than do service firms, a result contrary to what was expected. Because service firms' personnel usually have more contact with clients as part of the production process, it would be expected that service firms would delegate more authority to employees to serve customer needs (Chin & Pun, 2002). One explanation for the result could be that in manufacturing firms, operating personnel play a more important role in supporting main processes than evident in service firms. Concerning the TQMP with significant differences between groups, namely, empowerment and information-use-and-analysis, manufacturing firms show a higher level of use than do service firms for both constructs. The results are aligned with the work of Woon (2000), who studied a group of firms in a quality program in Singapore and found that service firms used some quality practices to a lesser degree than did manufacturing firms, such as information-use-and-analysis and process management, which affects quality performance. However, Woon (2000) didn't find significant differences for the soft aspects of quality, such as leadership, employee involvement, or customer focus. Huq and Stolen (1998), by contrast, indicated that the most relevant differences would be in the implementation of the techniques and tools of quality.

In small firms, a closer relation between top-level managers and operating personnel is evident, suggesting that managers may be more aware of customers' perceptions of the firm. The level of training and development of personnel is limited in small firms. On the other hand, it is more probable that small firms are more oriented to the person than are larger firms, which would be oriented to systems. In addition, small firms would be more market-oriented, would adapt better to changes, and would be more innovative when assisting with customers' needs (Ghobadian & Gallear, 1996). Additionally, with respect to the level of use of TQMP in small, medium, and large firms, Table 5 shows the mean values and standard deviations obtained for each construct. Significant differences were obtained in mean values for information-use-and-analysis ($p < .01$), employee training ($p < .01$), and business performance ($p < .001$). ANOVA was applied to determine the significant differences among means of the considered groups (Table 6).

Table 5
Level of Use of TQM Practices in Small, Medium, and Large Firms

Construct	Small: $n = 42$		Medium: $n = 103$		Large: $n = 111$	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
MgmCom	3.305	.727	3.423	.722	3.458	.752
CusFoc	3.357	.515	3.442	.755	3.550	.692
SupQMa	3.441	.662	3.458	.737	3.527	.716
EmpTr	3.062	.610	3.287	.726	3.503	.737
Empow	3.371	.561	3.332	.662	3.326	.664
EmpInv	3.310	.611	3.291	.756	3.472	.713
InfAn	2.802	.952	3.129	.937	3.411	.919
ProdDis	3.541	.580	3.587	.633	3.628	.657
OpPer	3.595	.727	3.916	.804	3.910	.745
BusPer	3.405	.763	3.968	.910	4.117	.790

The significant difference found with respect to business performance means that middle managers' perceptions are that large firms are more profitable than small firms are because large firms often pay better salaries and have more financial stability. Ahire and Golhar (1996) confirmed that large firms have larger budgets for personnel training and salaries payment. Furthermore, large firms have more human capital and financial resources than do small firms (Ghobadian & Gallear, 1997).

Table 6
ANOVA for the Differences between Means Considering Firm Size

Construct	<i>SS</i>	<i>df</i>	<i>SM</i>	<i>F</i>
MgmCom				
Between groups	.716	2	.358	.660
Within groups	137.114	253	.542	
CusFoc				
Between groups	1.314	2	.657	1.365
Within groups	121.771	253	.481	
SupQMa				
Between groups	.355	2	.177	.346
Within groups	129.838	253	.513	
EmpTr				
Between groups	6.468	2	3.234	6.357**
Within groups	128.722	253	.509	
Empow				
Between groups	.065	2	.033	.078
Within groups	106.244	253	.420	
EmpInv				
Between groups	1.934	2	.967	1.887
Within groups	129.620	253	.512	
InfAn				
Between groups	12.139	2	6.070	6.993**
Within groups	219.611	253	.868	
ProdDis				
Between groups	.251	2	.125	.310
Within groups	102.152	253	.404	
OpPer				
Between groups	3.542	2	1.771	3.013
Within groups	148.711	253	.588	
BusPer				
Between groups	15.598	2	7.799	11.144***
Within groups	177.056	253	.700	

Note. ** $p < .01$. *** $p < .001$

The results support hypothesis *H3*: the level of use of TQM is different in small, medium, and large firms. The significant difference obtained for information-use-and-analysis was expected because large firms are more structured than are medium and small firms and, in general, use more quality tools and techniques. Yavas and Rezayat (2003) found that larger organization size is related to a larger alignment with industry standards, which relates to information-use-and-analysis. Furthermore, Ghobadian and Gallear (1997) confirmed that large firms' activities and operations are governed by formal rules; have a higher degree of standardization and formalization; are system-dominated; and for decision making, are more fact-oriented than are small firms.

It was expected that large firms would have a higher use of TQMP than would medium and small firms because large firms adopted TQM systems before medium and small firms did. This can be observed when analyzing the level of use of TQMP that have significant differences among the groups. In general, the results show that, in the case of employee training and information-use-and-analysis, the level of use of TQMP is related to firm size. The results obtained are similar to those found by Yavas and Rezayat (2003) in the USA, Japan, Taiwan, and Hong Kong; Yavas and Rezayat found that a larger organization size is associated with a larger alignment with the industry standards, which is related to information-use-and-analysis.

Morrow (1997) analyzed the extent to which three TQM principles were related to work results and proposed that it is necessary to distinguish between the adoption of TQM principles and performance improvement. TQM principles and practices are the means, while the ends are the

reduction of defects, rework, or increasing customer satisfaction. A firm with more development in the use of TQMP should not be confused with a firm that has been successful in the implementation of TQM because the practices should be seen as causes or means that lead a firm to improve its performance. Thus, the level of development of TQMP should not be measured as an end in itself. For this reason, after making the descriptive analysis of the differences perceived among the use of TQMP for service and manufacturing firms as well as for small, medium, and large firms, analysis of the differences in the relationship between TQMP and performance followed.

The analysis of the differences in the relationship between TQMP and performance allows research questions 4 and 5 to be answered in so much as the questions refer to the extent that TQMP are related to performance in each identified group of firms. Table 7 shows the sample size of firms in each group. Pearson's correlation coefficients were calculated for operating performance and each TQM construct. Operating performance was used because a significant positive relationship exists between operating performance and TQMP. The results are shown in Table 8.

Table 7
Sample Size of Each Studied Group of Firms

Firm size	Service sector	Manufacturing sector
Small (fewer than 50 employees)	32	10
Medium (from 50 to 500 employees)	70	33
Large (more than 500 employees)	64	47

The results support hypothesis *H4a*: TQM practices are related to performance in small service firms in all the TQMP analyzed. In small service firms, the three TQMP related to operating performance were the following: employee training, management commitment, and customer focus. In small firms, employees have more contact with customers. Thus, employees in small service firms should be trained in customer service and service quality improvement. In addition, in small firms, decisions usually depend on few people in the strategic apex, and the role of managers becomes more visible for the members of the organization; furthermore, small firms have close contact with customers, and attention to customers can generate a competitive advantage for the organization.

Table 8
Pearson's Correlation Coefficient Between Operating Performance and TQM Practices for Each Analyzed Group

Construct	Service firms			Manufacturing firms		
	Small	Medium	Large	Small	Medium	Large
MgmCom	.694	.640	.662	--	.484	.617
CusFoc	.640	.607	.654	--	.696	.706
SupQMa	.528	.681	.622	--	.506	.634
EmpTr	.723	.622	.633	--	.590	.659
Empow	.510	.524	.417	--	.483	.499
EmpInv	.506	.642	.627	--	.436	.626
InfAn	.512	.605	.551	--	.556	.598
ProdDis	.539	.656	.713	--	.643	.669

Note. All values are significant ($p < .01$). For small manufacturing firms the values could not be determined because the sample size used for the analysis was small and the relations found were not significant.

The results also support hypothesis *H4b*: all TQMP analyzed are related to performance in medium service firms. In medium service firms, the TQMP are more related to operating performance and suppliers' quality management; product/service design; and almost at the same level, employee involvement and management commitment. In medium firms, the extent to which a firm manages its relations with suppliers becomes more important because firms usually specialize in certain processes and increase their interdependent relations with suppliers. Medium size firms should

satisfy their customers' needs by launching new products in which the design of the products and services acquire relevance; furthermore, when an organization grows, its personnel performance is more relevant for the achievement of results, which is obtained through good management of human resources. The manager's figure continues to be relevant to assure operating performance of the organization, but a key aspect in these firms is process management.

Finally, the results also support hypothesis *H4c*: all TQMP analyzed are related to performance in large service firms. In large firms of the service sector, the TQMP more related to operating performance are product/service design, management commitment, and customer focus. The design of the service is fundamental for the success of a large service firm because operations are carried out on a large scale, and the lack of rigor in the design of new services could result in less profitability to the firm; and the competition forces large firms to constantly introduce new services to the market and to be very rigorous in the evaluation of results. Management commitment is also relevant for large firms, although large firms are more structured than are small and medium firms, and the leader's role is distributed among several functional managers; an explanation is that large service firms are organized around business units where the leader's role is more visible to employees than is the case in medium firms. The importance of customer focus in large service firms relates to the activities derived from new services designs and what they invest to know the level of customer satisfaction. In general, for service firms, management commitment is the TQM practice more related to operating performance. Consequently, *H4*: TQMP are related to performance in service firms, was supported.

Considering manufacturing firms, the results do not support hypothesis *H5a*; it can't be said that TQMP are related to performance in small manufacturing firms. For small manufacturing firms, TQMP more related to operating performance could not be determined because the sample size used for the analysis was too small, and relations found were not significant ($p > .1$). Also, the results support hypothesis *H5b*: all TQMP analyzed are related to performance in medium manufacturing firms. Also, the results also support *H5c*: all TQMP analyzed are related to performance in large manufacturing firms. Consequently, *H5*: TQMP are related to performance in manufacturing firms, was not supported.

Regarding medium and large manufacturing firms, the TQMP more related to operating performance were customer focus, product/service design, and employee training. In manufacturing firms, the measurement of quality is more objective than in service firms because of the tangibility of the product. Customers manifest requirements that can be transmitted objectively to the production area through product specifications; this could have helped increase the correlation between customer focus and operating performance in manufacturing firms. Product design acquires relevance in medium and large firms because new products and the improvement of the existing ones increase customer satisfaction and increase business performance.

An important result obtained is that TQMP that correlate more to operating performance are not necessarily the practices that are used most often. This is particularly true for management commitment in service firms and customer focus in manufacturing firms; although these practices have the highest correlation to operating performance, they are not perceived as the most used practices, as Table 9 shows. The results would indicate that firms are not taking advantage of all the benefits that could be obtained from the use of the relevant TQMP. Finally, referring to the relationship between empowerment and performance, as well as the relationship between employee involvement and performance, initially, a partial correlation between each TQM practice and business performance was calculated by controlling for operating performance. Only two practices correlated significantly to business performance, although to a low degree: employee training and information-use-and-analysis, as is shown in Table 9. The obtained results do not support

Hypothesis *H6*: empowerment is not one of the three practices related to operating and business performance in Peru. Empowerment is also the practice with less correlation to operating performance. Hypothesis *H6* is rejected.

Table 9
Partial Correlation between TQM Practices and Business Performance, Controlling for Operating Performance

Construct	MgmCom	CusFoc	SupQMa	EmpTr	Empow	EmpInv	InfAn	ProdDis
BusPer	ns	ns	ns	.132*	ns	ns	.126*	ns

Note. ns= not significant. * $p < .05$

Discussion

Original TQM models didn't distinguish among industrial sectors, firm sizes, or even national cultures with respect to the effective use of TQMP. The lack of consideration of the variables that have an influence on the relationship between TQM and performance can lead to failure in the implementation of a TQM model. Also, it is important to remark that managers of service firms also assume a greater role in leading the implementation of TQM than managers of manufacturing firms because of the dynamic nature of the sector; in addition, TQM tools and techniques are better developed for manufacturing firms. Managers who seek the improvement of performance in their organizations through the adoption of TQM models or practices should be aware that not all TQMP have the same correlation to operating performance, and it is through operating performance that improvement in business performance is achieved. Also, it is important that managers consider that the effective use of TQMP is related to cultural factors. The finding acquires more relevance when the firm operates in different countries or even in different regions inside one country. Cultural factors could relate to the attitude of employees toward the use of certain TQMP and influence top-level managers in the implementation of TQMP. Peru is a country with a large power distance and strong uncertainty avoidance, which means that employees may feel uncomfortable with the delegation of power; employees' discomfort could result in a reduction in their performance. Empowerment is a TQM practice, and its effectiveness needs to be analyzed in different countries.

Regarding the implications for academics, a validated questionnaire to measure the relationship between TQMP and operating and business performance in small, medium, and large service and manufacturing firms was developed and tested. If the instrument is used in several moments of time, it can measure private firms' progress in the effective use of TQMP because, when the relationship between TQM and performance is measured, attention is focused on the objectives of the TQM model and not on the level of use of its practices. The instrument can be used in future studies to assess the effective use of TQM in a particular private firm. Also, only two TQMP showed a direct relationship with business performance in Peru when the interdependence assumption between TQMP is relaxed and when the relationship is controlled for operating performance, namely, employee training and information-use-and-analysis. The finding reflected the importance of adequately using quality tools and techniques; for TQM implementation to be successful in a firm, it is necessary to focus on the use of statistical controls of the processes. Also, the found positive relationship between the use of TQMP and the size of the firm raised a question about whether TQM would be more necessary for large firms than for small ones. Large firms are usually more structured than small firms are, and this could favour the implementation of TQMP in large firms. However, the possibility that large firms possess more resources to dedicate to TQM implementation as well as whether large firms obtain more benefits from the resources than could be obtained by small firms also needs to be considered.

Conclusions

The conclusions of this study were the following:

- A. TQMP have a significant direct relationship to operating performance in formal private organizations in Peru; this applies to small, medium, and large service firms and medium and large manufacturing firms. In small manufacturing firms, a relationship could not be established because the sample size was not big enough to process the data statistically. TQM is a valuable approach to improve customer satisfaction, a firm's reputation, and the quality level perceived by the customers.
- B. When interdependence was assumed among TQMP, a significant direct relationship between practices and business performance was not found; rather, the relation is indirect, through operating performance. Operating performance, measured through customer satisfaction and customers' perceptions of the firm were related in a direct way to business performance. Therefore, operating performance can be improved through TQMP.
- C. Significant differences exist between service and manufacturing firms when considering the level of use of TQMP, specifically in empowerment and information-use-and-analysis. Manufacturing firms showed a higher use of TQMP than did service firms. The difference in empowerment could be explained in terms of operating processes in manufacturing firms showing less variation than do service firms, motivating leaders of service firms' to prefer making most of the decisions and retaining power. The difference in information-use-and-analysis reflects that in manufacturing firms, more use of statistical techniques to control the processes are apparent than are in service firms.
- D. Considering size, significant differences in the use of TQMP in small, medium, and large firms were found. The differences were found for information-use-and-analysis as well as employee training. The level of use of the practices increases with the size of the firm. Large firms are more structured than are small and medium firms, which would lead to a more intense use of quality control tools and graphs, for which employee training is required. In general, it is appreciated that large firms tend to use the TQMP more than do medium firms, and medium firms tend to use the TQMP more than do small firms, although the differences found were not significant.
- E. Large firms showed more use of TQMP than did medium firms, and medium firms showed more use of TQMP than did small firms. One possible explanation for the result is that as firms' resources increase, the firm tends to invest in tools and techniques to sustain its growth, creating a virtuous circle of growth. If that be the case, what small firms should do is to invest more in TQM to accelerate growth and profitability. Another possible explanation is that small firms do not need to use TQMP to the same degree as large firms. If that is the case, what the results show is that TQM is more helpful in stable contexts as opposed to dynamic and flexible contexts because one source of competitive advantage for small firms comes from their flexibility.
- F. The two TQMP that showed significant differences between small, medium, and large firms, increasing their level of use as the firm size increased, were information-use-and-analysis and employee training, both of which are from the tools and techniques group of practices. Management commitment is the one TQM practice more related to operating performance in firms of the service sector.

- G. TQMP do not show the same relationship to operating performance for all kinds of firms. The result agrees with the argument that the usefulness of TQM is contextual. Besides the industrial sector, organization size is relevant because TQMP are more related to operating performance. The three TQMP that are more related to operating performance in small service firms are employee training, management commitment, and customer focus. Also, Empowerment correlated higher to operating performance in Lima than in the other city analyzed, and was more used in manufacturing than in service firms.
- H. Even though employee training is not one of the TQMP used more by small firms, it is the TQM practice more related to operating performance for small firms. The result shows that small firms are not taking advantage of all the benefits that the implementation of TQM could bring. The more plausible explanation is that implementing the tools and techniques would require on initial investment small firms are not willing to make.
- I. In medium and large manufacturing firms, the TQMP more related to operating performance were customer focus, product/service design, and employee training.
- J. In medium service firms, TQMP more related to operating performance were suppliers' quality management, product/service design, employee involvement, and management commitment. However, in large service firms, practices more related to operating performance are product/service design, management commitment, and customer focus.
- K. Goods/services design becomes more related to operating performance as service firms grow in size. With TQMP, customers make their known requirements, which are transmitted to the production area through product specification.
- L. Business performance showed a direct relationship with firm size. This could be attributed to the fact that large firms pay better salaries, increasing employee perceptions of a firm's profitability. Also, the obtained results show that in middle managers' perceptions, business performance and the use of TQMP grow when a firm increases in size.

Recommendations for future researches

The recommendations for future researches were the following:

- A. To develop or to adapt a model of quality management considering the cultural factors of diverse countries as well as consider the industrial sector, the size of the firm and the satisfaction of workers. For this purpose, the use of qualitative techniques and other quantitative techniques must be considered.
- B. To explore how different groups of firms implement TQMP and analyze how the use of the practices varies with time, which will require both longitudinal and qualitative research.
- C. To analyze the difference in the use of TQMP in firms that have and have not implemented formal TQM models and been certified in the use of them, as well as verify if operating performance is higher in firms with a formal TQM program than in firms that have not implemented a formal TQM program.
- D. To study about the understanding of how employees and top-level managers differ in their perceptions of TQMP used in the firm. This study would help to understand the factors that

constrain the implementation of TQM in organizations because managers are not usually deeply involved in the operating aspects of TQM.

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