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Approaches to adopting quality in SMEs and the impact on quality management practices and performance

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Approaches to Adopting Quality in SMEs and the Impact on Quality Management Practices and Performance

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ABSTRACT Do different approaches to adopting quality impact on performance in small and medium enterprises (SMEs)? Focusing on ISO 9000 and TQM as representing different ways of introducing quality, this paper investigates whether embarking on more clearly specified approaches to quality, such as ISO 9000 first or alternatively TQM, makes a difference to quality management practices and performance. Data from an Australian empirical survey of managers of small and medium enterprises were analysed and suggest that broader approaches to quality, such as TQM produce better quality outcomes. Organizations that had focused solely on ISO 9000 did not produce any noticeable performance benefits.

KEY WORDS: TQM, ISO 9000, quality approaches, performance outcomes, SMEs

Introduction

Organizations faced with introducing quality management face an array of approaches that can lead to the question of what to start with. Should a complete package offered by a consultant or guru be used, should the organization aim for ISO 9000 certification as a starting point? Are broader organizationally focused efforts such as TQM better and if so, how much better? Following the typologies developed by Brown & van der Wiele (1996), this paper analyses data from a questionnaire survey to test how different approaches to quality (i.e. between ISO 9000 and TQM programmes) might ultimately impact on quality management practices and performance. Additional analysis is conducted to see if performance is affected by the length of time an organization has either ISO 9000 or TQM in place.
Literature Review

Quality and SMEs

Much of the literature dealing with quality in small business focuses on issues relating to ISO 9000, probably due to the significant growth of interest in this throughout the business world in the 1990s and the significant impact this trend has had on small enterprises. A number of papers report on surveys of the ISO 9000 experience of SMEs (Brown et al., 1998; Gustafsson et al., 2001; McTeer & Dale, 1996; Rayner & Porter, 1991). These typically show high costs, disappointment and issues relating to consultants and auditors, although some report beneficial outcomes.

Studies have also looked at the application of broader quality concepts such as TQM in SMEs. Shea & Gobeli (1995) examined TQM in 10 small US organizations, specifically examining reasons for its adoption, tools and processes used, implementation processes and outcomes achieved. Moreno-Luzon (1993) examined the factors that were responsible for success with TQM in 44 small manufacturing firms in the Valencia region in Spain. They found that the firms experiencing greatest success with TQM placed more emphasis on innovation, in products, markets, processes and production equipment. Management was also more highly motivated. Van der Wiele & Brown (1998) examine the path from ISO 9000 to TQM in SMEs seeking to identify the factors that determine whether or not an organization progresses.

Others, such as Ghobadian & Gallear (1996), have looked at features of quality management and differences between large and small enterprises highlighting where small enterprises had advantages and disadvantages. Axland (1992) reported on the small organizations who have won Baldrige Prizes (a national quality award) in the USA. Some of the reported benefits of being small include: change can come quicker owing to fewer management layers, the ability to make decisions quicker, fewer staff to train and the ease of communication; if the CEO wants quality it is easier to implement in a small organization because the CEO is visible to employees on a daily basis so can emphasise the importance of quality. Research by North et al. (1998) showed that very small SMEs and service organizations generally used less formal means of managing quality. They were also less likely to see ISO 9000 as worthwhile for their business. SMEs in the manufacturing industry used inspection and testing as a mechanism for quality control while in the service sector, skilled staff, inspection and training tended to be employed.

Whilst there are studies that examine the links between quality and performance (Easton & Jarell, 1998; Hendricks & Singhal, 2001; Powell, 1995; Samson & Terziiovski, 1999), there is negligible research which examines the link between approaches to quality adoption and performance in SMEs (Anderson & Sohal, 1999). This issue is important since, as noted by Ghobadian & Gallear (1997), there are several characteristics that differentiate large firms from SMEs, which could affect the method and implementation of TQM. Their case study research investigating this issue produced several important findings. They concluded that basic concepts of TQM were equally applicable in the SMEs’ context; however, the size of organization influenced the type of strategies adopted in implementing TQM, including building cross-functional integration, the nature and substance of management leadership, suitable communication methods, the content and extent of training programmes, or the nature and extent of the organizational changes. Interestingly, their findings also suggest that SMEs had advantages with respect to the above factors.
In examining quality management adoption strategies, research by Van der Wiele & Brown (1998) found that whilst many SMEs could be classified as adopting a minimalist approach to ISO 9000, simply to gain the certificate and little else, a small proportion had adopted a more enlightened approach (termed converts or committed) and others had also engaged in broader activities that might be termed TQM. The experience of the converts and committed was that by involving employees and providing the appropriate training, they could in fact produce beneficial outcomes. The achievement of ISO 9000 certification had helped define quality, which could be used to develop broader quality processes and systems. However, the predominant view of smaller enterprises was that they felt compelled to adopt it and generally took a minimalist approach. Research to date, has not linked these strategies to quality performance.

TQM and ISO 9000

The literature has highlighted the debate on the link between ISO 9000 and TQM, whether they are complementary or contradictory to each other (Gotzamani & Tsiotras, 2001; Magd & Curry, 2003; Meegan & Taylor, 1997). ISO 9000 provides a generic template for a quality assurance system that can be applied irrespective of any contingent factor such as organization size, industry sector, and national conditions (Hoyle, 1994). Compared to TQM, ISO 9000 has two major advantages in terms of clarity of its contents and the evidence for achievement in the form of certification (Brown & Van der Wiele, 1996). The worldwide adoption of ISO 9000 as a quality system has led to a situation where firms tend to equate ISO 9000 with TQM and sometimes confuse the two, as noted by Foley et al. (1997, p. 25):

... since organizations applying the ISO 9000 standard can claim that their management system (or subsystem) meets an international quality management standard, it is not surprising that ‘quality management’, now referred to most often as total quality management (TQM), is confused with the quality management system of ISO 9000.

Frehr (1997) argues that TQM is far more than a quality management system based on ISO 9000 requirements in the sense that ISO 9000 merely focuses on the production process, while TQM focuses on the organization as a whole. Scholars suggest that ISO 9000 should be implemented within a TQM ‘environment’ in order to yield significant benefits, or, that ISO 9000 needs to be implemented in tandem with TQM (Askey & Dale, 1994; Sun, 1999; Whitford et al., 1994). This is because whilst initial ideas about ISO 9000 and TQM differed significantly, often more in application than in design, changes to the ISO standards (2000 version) in recent years have synthesized the concepts much better (Magd & Curry, 2003). Specifically, Bradley (1994) suggests that ISO 9000 can be an excellent start to TQM, if it is interpreted in a way that encourages the company to start on the process of continual improvement by teamwork of all people working in the company. Brown et al. (1993) also found that many firms started with ISO since it helped define quality as it was seen as less nebulous than TQM. However, as Meegan & Taylor (1997) note, there are certain key factors that influenced the successful transition from ISO 9000 to TQM. Whilst admitting that it is always debatable whether it is better to implement TQM or ISO 9000 first,
Ho (1994) suggests that ISO 9000 and TQM are complementary to one another. Empirical studies have shown that the integration of ISO 9000 and TQM have resulted in significant benefits for organizations (Beskese & Cebeci, 2001; Huarng, 1998; Lisiecka, 1999).

**Quality Adoption Typologies**

Brown & Van der Wiele (1996) developed a typology that highlights different ways companies adopt quality in terms of ISO 9000 and TQM based on the motivation for pursuing quality. Characteristics of the approaches are outlined below with the first three generally adopting ISO 9000 prior to TQM. The first approach is called *minimalists*, who are generally only concerned with obtaining an ISO certificate and are unlikely to adopt TQM. In general, they find few benefits from certification and consider it to be a costly exercise, and often use outside consultants to assist in certification. Their performance on quality measures are unlikely to show any significant sustainable improvement since they have not taken action to develop appropriate supporting philosophies and structures that involve employees and managers in continuous improvement and involvement. The second approach is called *converts*. Organizations in this group are initially sceptical about certification, do not have TQM and feel driven to become certified by external factors, but in the process of doing so discover beneficial outcomes. The goal of the organization is to develop a useful quality system and employees are involved in developing the procedures and work instructions that can prepare the way for further progress down the quality maturity path. The third group is labelled *committed*, representing organizations that embark on ISO 9000 because they see it as a means of improving business operations and efficiency rather than being purely driven by external forces, or they consider it to be an essential first step in moving into TQM. Some aspects of a quality system may be in place prior to seeking certification. Organizations from both the converts and committed groups can be expected to yield better performance from their quality activities given greater involvement of all in the organization and a commitment to the principles of quality. The committed group as described above may also fall into this category (*simultaneous ISO and TQM*) if they embark on both ISO and TQM simultaneously. They consider that one without the other will not maximize benefits and that pursuing ISO provides a more tangible, measurable and external measure of quality systems while TQM provides support for a more general approach to quality by developing an organization culture. The fifth approach is called *TQM first*. Organizations falling into this category typically commenced TQM well before ISO became such a significant issue. They have subsequently been put under pressure to gain ISO certification either because their customers are demanding it, they are seeking to enter markets where it is required or they are expecting their suppliers to be certified.

**Research Questions**

Based on this research background, this study seeks to re-examine these typologies by incorporating the element of time, and this is the area that differentiates this study from earlier ones. It has been suggested that the impact of a TQM programme and ISO 9000 certification will be realized over time (see for example, Ahire, 1996).
As such, an empirical study was designed that would examine the following questions.

**Question 1:** What impact do different approaches to adopting TQM programmes and ISO 9000 have on quality management practices and performance in SMEs?

**Question 2:** How does the length of time with a TQM programme or ISO 9000 certification affect the relationship between quality management practices and quality performance in SMEs?

By addressing these two questions, this study seeks to examine the interrelationship between TQM programmes and ISO 9000 certification and its impact on the organizational practices and performance (in terms of quality) and whether it is synergistic or antagonistic.

**Methodology**

**Research Instrument**

The instrument used in this study comprised two major parts. The first part comprises six constructs measuring quality management practices and the second part comprises measures of quality performance. The instrument utilises a 5-point Likert scale; representing a range of attitudes from strongly disagree to strongly agree. This provided a self-assessment of quality management practices and performance. Questions about length of time with TQM and ISO 9000 were also included.

**TQM measures**

A review of the previous empirical studies on TQM suggests that researchers have defined the TQM construct in numerous ways. The framework used by Samson & Terziovski (1999) was selected as representing the core TQM construct in this study primarily for the reason that it has been used in the largest study of Australian companies so far conducted. Moreover, Samson & Terziovski argue that their model is based on the criteria of the Malcolm Baldrige National Quality Award (MBNQA) that is accepted as representing quality management practices by several scholars, such as Juran (1995) and Dean & Bowen (1994). The MBNQA consists of six criteria of organizational practices and one criterion of organizational performance. The quality management practices embodied in these six criteria are leadership, strategy and planning, customer focus, information and analysis, people management, and process management.

**Quality performance measures**

Earlier studies, such as Saraph et al. (1989), Flynn et al. (1994), and Adam (1994) have used multiple items as the indicators of quality performance. However, it is maintained here that quality performance contains multifaceted aspects, and therefore a construct is preferred rather than individual items, as applied in recent studies on TQM such as Ahire et al. (1996), Grandzol & Gershon (1998), Samson & Terziovski (1999), and Dow et al. (1999). The construct for measuring quality performance developed by Ahire et al. (1996) derived its content from the selected items of Garvin’s (1984)
dimensions of quality, namely: reliability, performance, durability, and conformance to specification. The scale has shown strong validity and reliability; besides, the content also closely matched the purpose of this study so it was used here.

**Source of Empirical Data**

Empirical data were obtained through a random survey of 1000 managers, most of whom were senior managers in Australian companies who had knowledge of past and present organizational practices relating to continuous improvement and innovation in the firm. The sample was selected randomly Australia-wide with the population sample being based on the Australian Organization for Quality (AOQ) database, encompassing various industries in both manufacturing and non-manufacturing sectors. A total of 194 managers responded, whilst 150 questionnaires were returned to the researchers with RTS (Return to Sender) messages, indicating that the addresses were no longer valid. By discounting the number of RTS mails, the final response rate accounted for 22.8%. The proportion of the respondents was almost equally divided between manufacturing and non-manufacturing sectors (52.5% and 47.5% respectively). With regard to the position of the respondent in the organization, half of the respondents were quality managers and/or production/operations managers, one-third were senior managers (General Manager or Managing Director), and the rest were managers from other areas, such as marketing, finance, human resources, and administration. Most companies responding to the survey were certified to ISO 9000. Whilst not intentional, around 90% of the respondents represented SMEs; that is, they had less than 500 employees in the company, and around 60% of respondents came from organizations with fewer than 100 employees, representing small businesses.

**Data Analysis**

**Quality Profile of the Respondents**

With regard to ISO 9000 certification, 190 out of 194 respondents had been certified to this international standard, and, as is evident from Figure 1, most of them were certified between 1992 and 1998. The earliest year of certification is 1984 under the Australian Standard for quality system (AS 3900) and the most recent certification was obtained in 2000. Since most of the surveyed companies have been certified to ISO 9000, the declining trend since 1997 should be interpreted that most companies in Australia today have been certified to ISO 9000 rather than a loss of interest in ISO 9000. In regard to a formal TQM programme, 110 out of 194 (56.7%) companies affirmed that they had implemented such a program. This would seem to be relatively high since North et al. (1998) have found that many SMEs tend to practice quality in an informal way. It may be that the medium-sized enterprises tended to have formal quality programs per se.

Figure 1 also shows the approximate year when TQM was adopted/implemented by the sample of companies responding to the survey. Most of TQM programme implementation took place between 1994 and 1998 and the trend appears to decline since then. Therefore, it indicates a similar pattern to the trend of the implementation of ISO 9000. However, unlike the case of ISO 9000, it cannot be argued that the declining interest in TQM programmes indicates that most companies in Australia have adopted TQM. This is because nearly half of the companies in the sample did not implement formal TQM programmes, which may
truly reflect the population of the Australian firms. The more plausible inference of the declining trend of TQM programmes is that they have lost popularity among Australian companies for a variety of reasons. As discussed in the earlier part, when compared to ISO 9000, TQM is perceived to be ‘inferior’ in respect to clarity of the content and evidence for achievement. More importantly, TQM implementation is generally voluntary, whilst ISO 9000 certification could be driven by external parties, especially customers. This confirms the result reported in the study by Brown et al. (1993) among Australian companies that the implementation of ISO 9000 is largely driven by the demands of customers. Another plausible inference is that many firms might prefer to implement quality management practices without necessarily devising them into a formal programme or those who had initiated TQM programmes may have abandoned such formality and continued with certain quality principles. The avoidance of jargon when it comes to quality is relatively common given the publicity given to TQM failure.

The Impact of Length of Time with TQM and ISO 9000

Given the spread of time in the ISO 9000 certification and the implementation of TQM programmes, the impact of length of time with TQM and ISO 9000 was analysed with respect to the six quality management practices and product quality performance. Prior to this, data reduction was conducted to calculate the composite score of the seven constructs. Confirmatory factor analysis (i.e. congeneric model) was used to test the validity of the seven constructs, and the Goodness of Fit Indices (GFI) which exceeded the 0.9 criterion suggested by Hair et al. (1998) support their validity. The reliability analysis also produced good results where Cronbach’s alpha measure for the seven constructs exceeded the threshold point of 0.7 suggested by Nunnally (1978). The composite measure of each construct was estimated by calculating the mean value (Hair et al., 1998). The results of construct validity and reliability are presented in Table 1.
Table 2 presents bivariate correlations between the length of ISO 9000 certification and the adoption of formal TQM programmes (in year), and the result indicates that the length of a TQM programme has a significant impact on some of the quality management practices as well as product quality performance.

The significant correlation between the length of TQM adoption and the level of quality management practices is also reported in the study by Powell (1995), particularly in terms of training and process improvement. The length of TQM adoption is also significantly correlated to TQM performance (e.g. productivity) which has a similar scope with quality performance defined in this study. Similarly, the study by Taylor & Wright (2003) suggests that the success derived from TQM implementation is significantly associated with the time since adoption.

On the other hand, the length of ISO 9000 certification shows no impact on both quality management practices and quality performance, and this concurs with the earlier studies on the topic. In particular, the insignificant impact of the length of ISO 9000 implementation on quality performance expands the implication of the findings of the previous studies, such as Terziovski et al. (1997), Rahman (2001), Taylor & Wright (2003), and Martinez-Lorente & Martinez-Costa (2004). Whilst these studies show that there is no significant difference on quality management practices and quality performance between ISO and non-ISO companies, our study advances the findings by showing that the insignificant value of ISO certification does not change over time.

The result of the Multiple Regression Analysis (MRA) presented in Table 3 indicates that the length of time using TQM programmes significantly enhances the strength of the relationship between quality management practices and quality performance among TQM firms. This once again supports what is held by TQM scholars that TQM needs to

Table 2. Bi-variate correlations between the length of ISO certification and TQM adoption

<table>
<thead>
<tr>
<th></th>
<th>lead</th>
<th>plan</th>
<th>cust</th>
<th>info</th>
<th>peop</th>
<th>proc</th>
<th>Qual</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 9000 year</td>
<td>0.02</td>
<td>0.09</td>
<td>-0.08</td>
<td>0.10</td>
<td>0.05</td>
<td>-0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>TQM year</td>
<td>0.08</td>
<td>0.16</td>
<td>0.09</td>
<td>0.27**</td>
<td>0.21*</td>
<td>0.15</td>
<td>0.25*</td>
</tr>
</tbody>
</table>

* significant at $p < 0.05$

** significant at $p < 0.01$
be implemented with a long-term vision, and not considered as a ‘quick fix’ tool. Whilst these findings may support the obvious they do illustrate that the consequences of sticking with TQM ultimately provides performance benefits. Time may represent a range of variables such as training and the overall integration of quality principles into daily management processes and systems that will determine the impact of TQM adoption on the firms. From the perspective of diffusion theory, time of adoption also explains the extent to which TQM adoption would impact on performance. This is because early adopters of TQM (reflected in the longer years of implementation) would be more likely to accrue more benefits than the later adopters, who would simply jump onto the bandwagon’ without carefully tailoring their quality management practices to the unique conditions of their organizations (Powell, 1995; Westphal et al., 1997).

**Approaches to ISO 9000 and TQM Implementation and Performance**

In order to examine the impact of the approach taken by organizations in implementing quality, the sample of firms was divided into three groups based on the order in which ISO 9000 and TQM were implemented. Group 1 implemented ISO 9000 before TQM, Group 2 comprised firms that implemented ISO 9000 and TQM simultaneously, and the third group implemented TQM programmes before pursuing ISO 9000 certification. This classification is comparable to the companies of type 2 (converts), type 4 (simultaneous TQM and ISO) and type 5 (TQM first, then ISO) in the study by Brown & van der Wiele (1996). As presented in Table 4, 26 companies belong to Group 1, the other 45 firms belong to Group 2, and 21 firms belong to Group 3. This structure appears to be somewhat different to that in the study by van der Wiele & Brown (1997), where the

**Table 3. Multiple regression analysis**

<table>
<thead>
<tr>
<th>MRA between quality management practices and quality performance</th>
<th>$R^2$</th>
<th>Adj. $R^2$</th>
<th>$\Delta F$</th>
<th>sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQM firms</td>
<td>0.280</td>
<td>0.237</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>TQM firms with the year of implementation being accounted</td>
<td>0.306</td>
<td>0.251</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4. ANOVA test for three different groups of TQM firms**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1&lt;sup&gt;a&lt;/sup&gt; ($N = 26$)</th>
<th>Group 2&lt;sup&gt;b&lt;/sup&gt; ($N = 45$)</th>
<th>Group 3&lt;sup&gt;c&lt;/sup&gt; ($N = 21$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years with TQM</td>
<td>3.38</td>
<td>4.15</td>
<td>9.52</td>
</tr>
<tr>
<td>Years with ISO</td>
<td>6.92</td>
<td>4.15</td>
<td>5.16</td>
</tr>
<tr>
<td>Leadership (lead)</td>
<td>3.68</td>
<td>3.80</td>
<td>3.96</td>
</tr>
<tr>
<td>Strategic Planning (plan)</td>
<td>3.60</td>
<td>3.72</td>
<td>4.06</td>
</tr>
<tr>
<td>Customer Focus (cust)&lt;sup&gt;*&lt;/sup&gt;</td>
<td>3.83</td>
<td>4.11</td>
<td>4.23</td>
</tr>
<tr>
<td>Information &amp; Analysis (info)</td>
<td>3.78</td>
<td>3.54</td>
<td>3.98</td>
</tr>
<tr>
<td>People Management (peop)</td>
<td>3.37</td>
<td>3.44</td>
<td>3.82</td>
</tr>
<tr>
<td>Process Management (proc)</td>
<td>3.68</td>
<td>3.73</td>
<td>4.06</td>
</tr>
<tr>
<td>Product Quality (qual)</td>
<td>4.14</td>
<td>4.27</td>
<td>4.36</td>
</tr>
</tbody>
</table>

<sup>a</sup> Implemented ISO 9000 before TQM<br><sup>b</sup> Implemented TQM and ISO 9000 simultaneously<br><sup>c</sup> Implemented TQM before ISO 9000
majority of respondents see ISO as preceding total quality management (TQM) and as a relevant first step in implementing a TQM programme, and considered it as a good basis to start the process of quality improvement, while only few felt that TQM and ISO could not be implemented simultaneously and very few thought that TQM should be implemented before ISO.

The result of ANOVA in Table 4 shows the difference of the mean scores on the quality management practices for each group. Comparative analysis between Groups 1, 2 and 3 indicates that Group 3 shows the highest scores on most quality management practices and quality performance, followed by Group 2, and finally Group 1. This difference, although not significant, corresponds with the years of TQM implementation and is not affected by length of ISO 9000 certification (as discussed earlier). This suggests that firms who implemented TQM programmes prior to seeking ISO 9000 certification were probably more committed to broader concepts of quality than certification and the resulting benefits in terms of performance reflect this.

Whilst it might have been hypothesized that an early start with ISO may have assisted on information and on processes, the results do not bear this out. Organizations well advanced in TQM tend to be better on the dimensions of customer focus and process management. Those firms with substantial experience with ISO 9000 do not show any advantage on all dimensions of quality, possibly providing support for the minimalist motivation for certification. This finding concurs with the study by Sun (1999) on the patterns of TQM versus ISO 9000 implementation in 20 countries that indicates that TQM adopters achieve higher improvements than ISO adopters at all levels of application.

Finally, the last finding of this study is important since it shows that whilst ISO 9000 has no significant impact on organizational practices and performance, it does not undermine the positive impact of TQM on these variables. This negates several arguments which imply that ISO 9000 could hinder organizations from reaching the ‘fullness’ of TQM. Martinez-Lorente & Martinez-Costa (2004), for example, argue that not only does ISO 9000 (1994 version) not satisfy a large amount of good quality management practices promoted by TQM, but it also incorporates several elements that are opposite to TQM principles, such as emphasising error detection rather than error prevention, and controlling suppliers rather than building up mutual relationships. Similarly, Hind (1996) argues that while ISO 9000 can be considered as a subset of total quality management, the organizational culture that is required to implement ISO 9000 does not fit to the other aspects of total quality. Our result does not support this notion, and we therefore maintain that there is no ‘harm’ for organizations that have implemented TQM to seek ISO 9000 certification should they receive external pressures to do so. Moreover, as suggested by Magd & Curry (2003), the 2000 version of ISO 9000 has been developed with a closer alignment with TQM philosophy. This is reflected in the eight principles of quality management that include customer focus, leadership, people involvement, continuous improvement, and mutual supplier relationship.

Conclusion

The empirical findings in this study demonstrate that approaches to the management of quality do impact on management practices and outcomes in organizations. The lengths of TQM programmes have been shown to affect the level of several organizational practices that are considered as the key practices in managing quality as well as the product
quality performance itself. On the other hand, the length of the years of ISO 9000 certification failed to produce similar results. Analysis of different approaches in managing quality in terms of the starting point using either TQM or ISO 9000, or both, further confirms that only commitment to TQM as a long-term programme differentiates firms in terms of their practices and performance in relation to quality management. In general, this study indicates that time could serve as a proxy to the maturity of TQM implementation as well as its impact on firms’ performance.

References


