



# Total quality management and performance

TQM and  
performance

## The role of organization support and co-worker support

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### Abstract

**Purpose** – The purpose of this paper is to explore the relationship between the extent of total quality management (TQM) implementation and organization performance, and the moderating effect of co-worker support and organization support on the TQM/performance relationship.

**Design/methodology/approach** – A questionnaire survey was developed and distributed to a sample of firms selected from the motor vehicle parts and accessories industry.

**Findings** – Analysis of the data supports a strong positive relationship between the extent of implementation of TQM practices and organization performance. This study also found that co-worker support and organization support moderated the relationship between TQM implementation and organization performance.

**Research implications** – This study has important implications for managers. First, it motivates managers (and provides a justification) to invest in the time and resources to implement TQM programs. Based on the results of this study, the implementation of TQM practices is associated with enhanced organization performance. Second, evidence from this study signals the importance of developing an environment or “culture” of support to further enhance the performance outcomes of TQM implementation. If employees do not feel there is acknowledgement and support from the organization and from work colleagues, then the implementation of TQM programs may be sub-optimal.

**Originality/value** – There is increasing recognition of the importance of human factors in successful TQM implementation. Within this context, no previous research has empirically examined the synergistic moderating effect of co-worker support and organization support on the relationship between TQM and performance.

**Keywords** Total quality management, Performance management, Organizational performance

**Paper type** Research paper

### Introduction

The core ideas of total quality management (TQM) were introduced in the mid-1980s by, most notably, W. Edwards Deming, Joseph Juran and Kaoru Ishikawa (Hackman and Wageman, 1995). Whilst it is acknowledged that TQM is not a clear-cut concept (Hackman and Wageman, 1995), TQM is generally understood as an integrated organization strategy for improving product and service quality (Waldman, 1994). Since the mid-eighties TQM has been (over) sold as a near-universal remedy for a range of organizational problems, including improved organization performance. This is remarkable considering academics have acknowledged for many years that universal principals cannot be successfully applied to organizations. Contingency theory with its “no one best way” dictum, asserts that high performance is a function of the alignment between organization systems/processes and various context factors. Indeed, empirical research addressing successful TQM implementation is “crying out” for a contingency theory approach: while most studies report a positive relationship between TQM and



performance (e.g. Brah *et al.*, 2002; Hendricks and Singhal, 2001; Kaynak, 2003; Terziovski and Samson, 1999), some studies report a negative relationship between the two variables (e.g. McCabe and Wilkinson, 1998; Yeung and Chan, 1998). The identification of contextual factors effecting the successful TQM implementation has thus recently emerged as an important research agenda (Douglas and Judge, 2001; Sadikoglu, 2004).

Within the context of successful TQM implementation, there is increasing recognition of the importance of human factors in quality management (Brah *et al.*, 2002; Chen, 1997; Fok *et al.*, 2000; Golhar *et al.*, 1997; Montes *et al.*, 2003). Many of the basic elements of TQM involve people, such as teamwork, participative management, creativity, effective communication, customer feedback, employee involvement and empowerment, employee and management trust and support (Guimaraes, 1994). For an organization to realize the benefits of TQM, the consideration of human factors is critical for the successful implementation of TQM. Human factors previously identified in the TQM literature include management (leadership) style, type of employees, departmental interaction, management commitment, employee's attitude toward change, authority to empower employees, rewards/recognition for innovation and citizenship behaviours (Mann and Kehoe, 1995; Montes *et al.*, 2003). This study examines two human (or behavioural) factors: co-worker support and organization support. These two support variables are consistent with the view that employees' perception of tolerance, support, cohesion and the intrinsic acknowledgement of employees' organizational contributions are important factors in the successful implementation of TQM (Montes *et al.*, 2003). TQM implemented within a supportive organization environment is more likely to motivate employees to work harder and smarter in achieving quality outcomes for the organization (Hackman and Wageman, 1995). The purpose of this study is, therefore, to firstly examine the association between the implementation of TQM practices and organization performance, given past equivocal results; and secondly, to examine the moderating effect of co-worker support and organization support on the TQM/performance relationship, consistent with a contingency theory approach.

## Theoretical development and hypotheses

### *TQM and performance*

Preliminary evidence seems to indicate that TQM-adopting firms obtain a competitive advantage over firms that do not adopt TQM (Brah *et al.*, 2002; Powell, 1995). Firms that focus on continuous improvement, involve and motivate employees to achieve quality output and focus on satisfying customers' needs are more likely to outperform firms that do not have this focus. Thus, we can expect that to the extent an organization implements TQM practices, performance should be enhanced. The first hypothesis summarizes this expectation and provides a benchmark in which to examine the moderating effects of co-worker support and organization support on the TQM/performance relationship.

- H1. The degree of implementation of TQM practices will be positively associated with organization performance.

### *Co-worker support*

Co-worker support refers to co-workers assisting one another in their tasks when needed by sharing knowledge and expertise as well as providing encouragement and support (Zhou and George, 2001). For example, colleagues may share their knowledge and expertise when an employee is faced with a difficult and novel task for which a solution is not readily available (Scott and Bruce, 1994). Employees may also acquire task-relevant knowledge and expertise from supportive co-workers, which may make

new ways of doing things possible (Woodman *et al.*, 1993). In this context, working with helpful, supportive colleagues promotes an environment where new ideas can be discussed more openly and freely. According to Hackman and Wageman (1995) and Beer (2003), implicit in the TQM philosophy are values of teamwork and collaboration in the pursuit of quality and continuous improvement. It appears evident that working with supportive co-workers who readily share task-relevant information and expertise is more likely to be associated with successful TQM implementation. That is, for firms implementing TQM practices, higher co-worker support is likely to be associated with enhanced organizational performance.

Referring to the TQM literature, some studies have highlighted the importance of co-worker support without empirically testing their assertions (e.g. Montes *et al.*, 2003). Lam's (1995) survey of front-line supervisors working in organizations that had implemented a TQM program for at least two years found that 71 per cent of respondents reported an improved relationship with co-workers. This provides empirical evidence for the importance of the association between TQM implementation and co-worker support; however, the links to performance were not tested. Brah *et al.*'s (2002) research also provides some empirical support for the importance of co-worker support in TQM firms compared to non-TQM firms. They surveyed Singaporean companies to show that TQM firms reported higher means on "human resource focus" (which includes peer support) compared to non-TQM firms. The link to performance (again) was not part of their research design.

Based on the foregoing the following hypothesis is proposed:

- H2. In organizations characterized by a greater focus on co-worker support, greater implementation of TQM practices will be positively associated with organization performance.

#### *Perceived organization support*

Perceived organization support refers to employees' perception of being valued and cared about by their organization (Eisenberger *et al.*, 1986). This concept is theoretically based on reciprocity in the social exchange relationship. In situations of perceived support, employees' trust that their increased effort toward reaching organization goals will be noticed and rewarded (Allen and Brady, 1997; Eisenberger *et al.*, 1986). Although an organization may encourage support in a number of areas, this study focuses specifically on organization support for creativity, which refers to the extent to which an employee perceives that the organization encourages, respects, rewards and recognizes employees who exhibit creativity (Zhou and George, 2001). Indeed, the organizational creativity literature has demonstrated that organizational contexts can play a significant role in encouraging or impeding employee creativity (Scott and Bruce, 1994). For example organization contexts may facilitate creative performance by directing employees' attention and cognitive energy toward the generation of new and useful ideas (Scott and Bruce, 1994; Zhou and George, 2001). As stated above, one of the central tenets of effective TQM implementation is employees' commitment to continuous improvement of processes. Organizations implementing TQM practices that also acknowledge and reward employees' new and useful ideas are more likely to experience a favourable effect on performance.

Turning to the TQM literature, in a comparative study of non-TQM and TQM organizations, Allen and Brady (1997) found that perceived organization support was higher in TQM organizations than non-TQM organizations. Further, another comparative TQM/non-TQM study focussing on firms in the motor vehicle parts

and accessories industry, demonstrated that respondents (supervisors) in TQM firms were more satisfied with top management support, commitment and encouragement (important elements of overall organization support) compared to non-TQM firms (Golhar *et al.*, 1997). Both these studies provide empirical evidence of the significant role of organization support in firms implementing TQM practices. The effect on performance of high organization support in TQM adopting firms, however, was not examined in either of these cases.

Based on the foregoing the following hypothesis is proposed:

- H3.* In organizations characterized by greater focus on organization support, greater implementation of TQM practices will be positively associated with organization performance.

## Research methods

### *Sample and data collection*

This study focussed on the motor vehicle parts and accessories manufacturing firms in Australia. This selection was made because there is evidence that the automotive industry in Australia has embraced the role of quality in productivity improvements (Terziovski and Samson, 1999). Although we examine one industry, a wide range of firms is represented in the sample. For example, the motor vehicle parts and accessories industry represents a wide range of production technologies including labour-intensive as well as capital-intensive operations. Firms would also adopt different manufacturing strategies, such as low cost standard products, differentiated make-to-order products, and a combination of the two strategies. Thus we can expect firms to be at various stages of TQM implementation.

Phone calls were made to all 187 firms classified as motor vehicle parts and accessories manufacturers in Melbourne, Australia (as classified by [www.yellowpages.com.au](http://www.yellowpages.com.au)) inviting them to participate in the study. From this process, 160 firms agreed to participate. Questionnaires were distributed to the owner or plant manager, whoever was deemed appropriate following a telephone conversation. Each participant was provided a questionnaire together with a covering letter explaining the purpose of the study and assuring anonymity. A reply-paid envelope was included for the return of the completed questionnaire. A prize competition entry form and a separate reply-paid envelope for the prize competition entry form were also included in an attempt to increase the response rate. Of the 160 distributed questionnaires, 84 were returned, representing a response rate of 53 per cent. The final sample consisted of 80 responses since 4 questionnaires were incomplete. The average length of tenure for respondents was 6-10 years, the average age was 30-44 years old, 36 per cent of respondents had only completed secondary school while 60 per cent had completed a university diploma or degree, the size of firms ranged from 10 to greater than 200 employees and all firms had implemented TQM practices at least to some degree.

### *Variables and measures*

*TQM.* TQM was measured using Chenhall's (1997) seven-item instrument. Similar to other TQM measures (e.g. Douglas and Judge, 2001), the Chenhall measure seeks to gauge the extent to which firms/production divisions have progressed in their implementation of TQM practices. Respondents are asked to rate the degree of implementation of each TQM practice using a seven-point Likert scale with anchors "no action" and "achieving outstanding progress". The items comprising the instrument focus on well accepted TQM practices such as reduction in non value-added

activities, involvement of employees in quality improvement programs and a focus on reliable delivery. Chenhall's measure is more relevant for manufacturing firms thus it was considered the instrument of choice in this study of manufacturing organizations. Following a principal component factor analysis with Varimax rotation, one factor was extracted (using an Eigenvalue of  $> 1$  as the criterion for extraction). Cronbach's alpha for this scale was 0.88.

*Organizational performance.* This study uses Govindarajan and Gupta's (1985) self-rated performance measure. While subjective self-rating performance measures have been criticized in the management literature (Thornton, 1968), there is empirical evidence to suggest that the associated halo effect is over-rated and that self-rating provides a more accurate measure of performance than objective upper management ("superior") ratings (Heneman, 1974; Viswesvaran Schmidt and Ones, 2005). Dunk (1993) argues that upper managers may only have fragmented knowledge of the job behaviours of their subordinates because managers have limited personal contact with subordinates, and that limited personal contact is restricted to particular situations. Given that there are many precedents in organization research for using subjective self-rated performance measures (e.g. Douglas and Judge, 2001, Powell, 1995), we feel the use of the Govindarajan and Gupta's (1985) performance instrument is justified. This instrument measures performance along a multiplicity of dimensions rather than on any single dimension and utilizes the degrees of importance of each dimension as weights to calculate the overall performance measure. The six dimensions include both financial and non-financial criteria, for example, achievement of budget targets, quality of output, new product development and cost reduction. One factor was extracted following a principal component factor analysis with Varimax rotation and the Cronbach's alpha for this scale was 0.83.

*Co-worker support.* To measure this construct we adopted Zhou and George's (2001) four-item scale that requires respondents to consider the extent to which they believe they receive help and support from their co-workers in their work unit. A sample question is "The workers in this unit are willing to share their expertise with each other". Again following a factor analysis, one factor was extracted and the Cronbach's alpha was 0.87.

*Organization support.* To measure organization support we used the four-item scale developed by Zhou and George (2001). Sample questions are "Creativity is encouraged at [company]" and "Our ability to function creatively is respected by the leadership". The Cronbach alpha for this scale was 0.95.

## Results

Means, standard deviations and correlations are reported in Table I. There are significant positive correlations between performance and each of the independent variables, providing preliminary support for the research model. In particular one

	Mean	SD	1	2	3	4
1. Performance	34.31	9.3				
2. TQM practices	34.80	6.69	0.63 **			
3. Co-worker support	20.38	4.63	0.48 **	0.49 **		
4. Organization support	17.92	6.01	0.67 **	0.56 **	0.48 **	
5. Organization size	48.25	22.10	0.02	0.13	0.07	-0.06

Note: \*\*  $p < 0.01$

**Table I.**  
Descriptive statistics and  
correlations



should note the high correlation between TQM practices and organizational performance ( $r = 0.63$ ,  $p < 0.01$ ). Organization size (number of employees) was included as a control variable (see Douglas and Judge, 2001; Sadikoglu, 2004); however, size was not significantly correlated with performance or any of the independent variables thus size was not included in the regression models to follow.

Moderated regression analysis using ordinary least squares was employed to test the studies hypotheses. Tests on the adequacy of the regression models employed indicate that the assumptions of the models were satisfied by the data. We have assumed that, consistent with the practice of prior management researchers, Likert-type scale data closely approximates interval-level data (Berry and Feldman, 1985). All regression results are reported in Table II. *H1* was tested by comparing the increase in variance (increase in  $R^2$ ) explained between Model 1 and Model 2, where Model 1 represents the regression of the independent variables (co-worker support and organization support) on the performance variable and Model 2 adds TQM practices. The results indicate that the degree of TQM practices implemented is positively associated with organization performance ( $p < 0.01$ ), and indeed the addition of the TQM variable increases the  $R^2$  by 0.09. Therefore the data supports *H1*.

To explore the moderating influence of co-worker support and organization support postulated in *H2* and *H3*, Models 3 through 6 were created. Firstly, Models 3 and 4 are used to test *H2* by showing the increase in explained variance after adding the first-order interaction between co-worker support and TQM practices. The results in Table II show that the interaction term (TQM  $\times$  co-worker support) was statistically significant ( $p < 0.01$ ) and adds 0.06 to the explanatory power of the model. This result provides empirical support for the moderating impact of co-worker support on the relationship between TQM practices and organization performance (*H2*). Similarly, Models 5 and 6 are used to test *H3* by showing the increase in explained variance after adding the first-order interaction between organization support and TQM practices. The results indicate that the interaction term (TQM  $\times$  organization support) is statistically significant ( $p < 0.01$ ) and further this term adds 0.05 to the explanatory power of the model. This result provides empirical support for the moderating effect of organization support on the relationship between TQM practices and performance.

To further understand the exact nature of these moderating relationships identified in Table II, additional interpretive analysis was conducted. Using standard graphical techniques, we found that organizations characterized by an environment of relatively high support (from both co-workers and the organization) exhibited a stronger relationship between TQM practices implemented and organization performance; whereas organizations characterized by an environment of low support did not demonstrate a significant relationship between TQM and performance. Figure 1 displays the graphs for these contingent effects. These findings offer new and practical insights into the role of supportive organizational environments and the effectiveness of TQM implementation, as discussed in the next section.

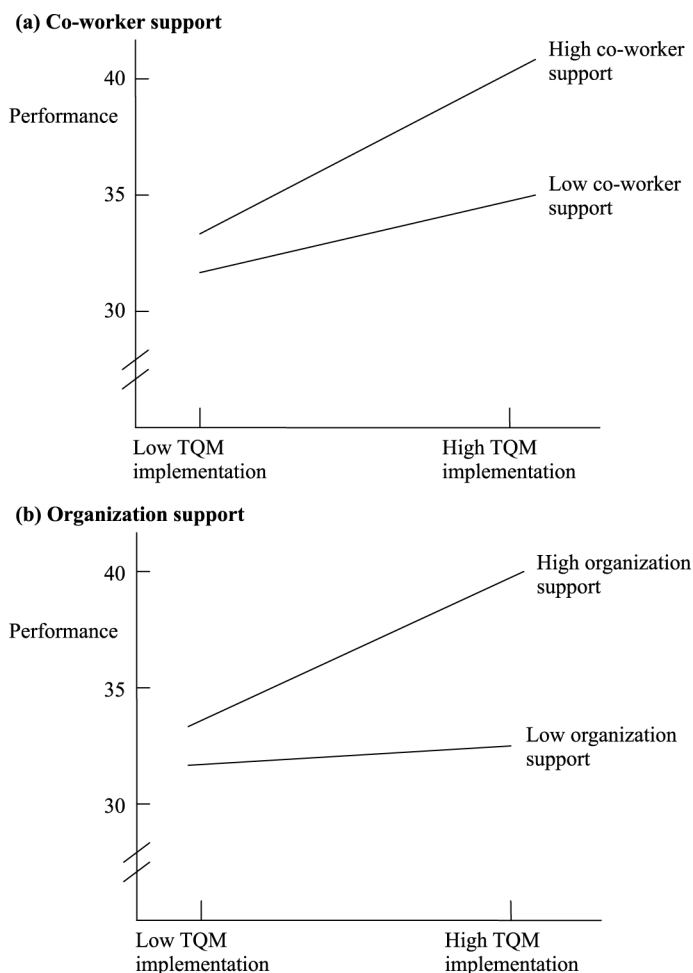
## Discussion and conclusions

### *Theoretical implications*

This study examined, firstly, the TQM-performance relationship and secondly, the effective implementation of TQM with respect to support afforded by the organization and support among co-workers. Evidence from this study supports a strong positive relationship between the extent of implementation of TQM practices and organization performance. Previous research on the TQM/performance relationship has been equivocal, however consistent with Douglas and Judge (2001) and Brah *et al.* (2002), we

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	10.70 (25.31)	- 26.09 (26.38)	0.37 (28.41)	327.67 ** (112.75)	- 17.22 (25.44)	267.51 ** (98.02)
Co-worker support	2.57 * (1.18)	1.41 (1.16)	2.78 * (1.24)	- 12.98 * (5.40)		
Organization support	3.14 ** (0.54)	2.36 ** (0.56)			2.55 ** (0.54)	- 3.77 (2.17)
TQM practices		2.75 ** (0.85)	4.27 ** (0.85)	- 5.84 (3.47)	3.07 ** (0.81)	- 5.94 (3.10)
TQM × co-worker support				0.48 ** (0.16)		0.20 ** (0.06)
TQM × organization support						
Adjusted $R^2$	0.46	0.55	0.42	0.48	0.52	0.57
$F$	32.58 **	28.05 **	27.13 **	23.09 **	41.06 **	33.45 **
Change $R^2$		0.09		0.06		0.05
<b>Notes:</b> * $p < 0.05$ ; ** $p < 0.01$						

**Table II.**  
Results of regression  
analysis



**Figure 1.**  
Conditional effects on the  
relationship between TQM  
practices and performance

found that the degree of implementation of TQM practices was positively related to organization performance. Our research reinforces Douglas and Judge's (2001) assertion that mere rhetoric about concern for quality will not guarantee success; it is the extent of implementation of TQM practices that is related to favourable outcomes.

This study also found that an environment of support within the organization enhances the effectiveness of TQM implementation, confirming the appropriateness of a contingency theory approach to the successful implementation of TQM. More specifically, organization support that encourages a positive reciprocal relationship between employees and their organizations, and strong collegial support that promotes sharing knowledge in an encouraging, supportive manner produce a synergistic effect on the TQM/performance relationship. That is, although our results demonstrate that the implementation of TQM practices is associated with improved performance, an environment of support (derived from the organization and co-workers) provides a synergistic "boost" to organizational performance. This finding is novel to the TQM



literature. It is consistent, however, with the more recent TQM literature that highlights the value of integrating human resources management into the TQM process (Fok *et al.*, 2000; Lam, 1995; Montes *et al.*, 2003). Human resource management practices (which include the provision of a supportive organization environment) can be used to reinforce employees' commitment and dedication to improving the quality of products and services. Future research could consider a number of other human resource related practices (within a contingency theory framework) to explore the interactive effect of that practice on the TQM/performance relationship. Within this context, human resource practices of potential consideration could include: useful feedback from co-workers (see Zhou and George, 2001), reward systems (particularly bonus reward systems related to new ideas) and employee training and development for creativity and lateral thinking.

#### *Managerial implications*

This study has important implications for managers. First, it motivates managers (and provides a justification) to invest in the time and resources to implement TQM programs. Based on the results of this study, the implementation of TQM practices is associated with enhanced organization performance.

Second, this study signals the importance of ensuring a supportive organizational environment for the effective implementation of TQM. Evidence from this study suggests that organizations should develop an environment or "culture" of support, which includes fostering support among co-workers, for the effective implementation of TQM. If employees do not feel there is sufficient acknowledgement and support from the organization and from colleagues with whom they work, then firms may not reap the benefits of TQM programs.

#### *Limitations and conclusions*

The contributions of this study must be considered in light of the limitations. The firms in this study were drawn from the motor vehicle parts and accessories industry and therefore may only be generalizable to that industry. In addition, even though a sample size of 84 is adequate for statistical analysis, caution must be exercised in generalizing the findings beyond the associated hypothesis tests. The use of a self-rating scale to measure performance is likely to have higher mean values (higher leniency error) and a restricted range (lower variability error) in the score (Thornton, 1968). Finally, the survey research methodology allows for examination of statistical association at one point in time, and statements about the direction of relationships can only be made in terms of consistency of results with the effects proposed in the theoretical development. Future research could employ longitudinal research methods to systematically investigate the theoretical links proposed in our study.

Notwithstanding the limitations discussed above, the study provides important contributions to the literature and for managers. In particular, the study emphasizes the importance of implementing a comprehensive TQM program comprising the key practices of TQM, rather than implementing a few selected practices. Further, consistent with Powell's (1995) assertion that complementary organization structures/processes may enhance the TQM/performance relationship, we found that an environment of support derived from the organization and colleagues was associated with a synergistic effect on this relationship. Within a context of ever increasing competition among firms, these results may provide managers with the means of sustaining a competitive advantage within the motor vehicle part and accessories industry.

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