

5.1 SUMMARY AND CONCLUSION

This study examined the relationship between three variables - motivation for certification, implementation effort of ISO 9000 QMS and organizational performance, in Malaysian construction firms. In this study, analysis of mean value, t-test, correlation and regression were performed on the collected data to have a better understanding of the three variables and the relationship between the three variables.

According to the CIDB's ISO certified construction firms directory, about 89.2% of ISO 9000 certified construction firms are Grade G7 (no limit in tendering capacity). In this study, 115 out of 125 respondent firms (92%) are Grade G7 contractors. From the statistic of the respondent firms, 72% of the respondent firms have gained the ISO 9000 certification for a period of less than or equivalent to 5 years. From these figures, it can be observed that the enforcement of ISO 9000 registration by CIDB Malaysia since 2009 has actually caused a huge increase in the adoption of ISO 9000 certification in Malaysian construction firms, especially Grade G7. In addition, this study also found that the most important reason for Malaysian construction firms to adopt ISO 9000 certification is to comply with the government regulation.

The findings of the mean value show that the top three most important motivations for ISO 9000 certification of Malaysian construction firms are to comply with government regulation (mean=4.46), to improve the corporate image and gain marketing advantage (mean=4.38) and to improve the quality of work done (mean=4.34). The least important motivation for ISO 9000

certification is to reduce the costs of operation (mean=3.75). Thus, this finding indicates that Malaysian construction firms need external pressure to adopt ISO 9000 QMS. Hong Kong and Singapore contractors were also found to have a similar ranking on the reasons for ISO 9000 certification as shown in the studies by Dissabayaka *et al* (2002) and Low & Yeo (1997). In the global survey of Corbett & Luca (2002) and Pan (2003), Hong Kong and Taiwan firms also perceived that corporate image improvement through ISO 9000 certification is more important than quality improvement through ISO 9000 certification.

The results of the mean value and t-tests ($t=3.10$ at $p<0.01$) analyses show that the Malaysian construction firms' level of external motivation for certification is significantly higher than the level of internal motivation for certification. However, with the mean value of 4.12 (4=important, 5=extremely important), internal motivation is still important for Malaysian construction firms to seek and maintain ISO 9000 certification. The correlation results presented in Table 4.6 also show that there is a significant correlation between internal motivation for certification and external motivation for certification. These findings suggested that even though CIDB Malaysia imposed the regulation and created external motivation resulting in Malaysian construction firms being forced to adopt ISO 9000 certification, most Malaysian construction firms still adopted ISO 9000 certification with a high level of internal motivation for certification. Thus, the adoption of ISO 9000 QMS for most Malaysian construction firms is actually driven by both types of motivation for certification. This finding is consistent with the finding of Low &

Yow (1999) who focused on Singapore construction firms. However, this finding contradicts the findings of Lo (2002) and Lau & Tang (2009) who focused on Hong Kong ISO 9000 certified contractors. Lo (2002) and Lau & Tang (2009) found that most of the Hong Kong contractors adopted ISO 9000 certification because of the external motivation (government regulation) only. Lo (2002) also concluded that as there was no internal motivation for certification, there was no improvement in the quality of services in the Hong Kong construction industry as expected after the implementation of ISO 9000 QMS.

The empirical results of correlation and regression analyses show that internal motivation for certification can directly and positively affect the implementation effort of ISO 9000 QMS. This supports the findings of Jang & Lin (2008) and Prajogo (2010). This finding indicates that it is important for Malaysian construction firms to have internal motivation for certification because a higher level of internal motivation for certification does lead to a higher implementation effort of ISO 9000 QMS. The empirical results of correlation and regression analyses also show that external motivation for certification can directly and positively affect the implementation effort of ISO 9000 QMS. This supports the findings of Prajogo (2010) but contradicts the findings of Jang & Lin (2008). This finding indicates that the mandatory requirement of ISO 9000 adoption from CIDB Malaysia does also lead to a higher implementation effort of ISO 9000 QMS in Malaysian construction firms. With the positive effect of both types of motivation for certification on the implementation effort of ISO 9000 QMS, it can be concluded that motivation

for certification of Malaysian construction firms has a positive effect on their implementation effort of ISO 9000 QMS. The standardized Beta coefficients of internal motivation and external motivation in regression model 1 presented in Table 4.7 show that internal motivation for certification (Beta=0.42) has a stronger positive effect on the implementation effort of ISO 9000 QMS, compared to external motivation for certification (Beta=0.27). This finding is similar with the finding of Prajogo (2011). It is not surprising that this study led to this finding because numerous studies (Singels *et al*, 2001; Gotzamani & Tsiotras, 2002; Llopis & Tari, 2002; William, 2004; Terziovski & Power, 2007; Zaramdini, 2007; Jang & Lin, 2008; Prajogo, 2011; Kemenade *et al*, 2011) in the literature review found that internally motivated certified organizations tend to have greater benefit and their employees tend to put more effort to implement ISO 9000 QMS, compared to externally motivated organizations.

The finding from the mean value (ranging from 2.10 to 5.00) of each respondent firm's implementation effort of ISO 9000 QMS shows that Malaysian ISO 9000 certified construction firms vary in terms of ISO 9000 implementation effort. This finding supports the finding by Lee *et al* (2009) who found that there are different implementation levels of ISO 9000 principles amongst ISO 9000 certified organizations. Some organizations may put in more effort to implement ISO 9000 QMS beyond the minimum requirements as stated in the ISO 9001 document. However, some organizations may just put in limited effort to fulfill the requirements. The average mean value of all the respondent firms' implementation effort of ISO 9000 QMS is 3.94 (where 3=medium effort, 4=high effort). It is considered that

Malaysian construction firms generally put in high effort to implement ISO 9000 QMS. This high effort for ISO 9000 implementation may be due to Malaysian construction firms having both a high level of internal motivation and external motivation for certification, as discussed above. On the other hand, Malaysian construction firms put in the most effort for documentation (mean=4.22) and the least effort for capital investment (mean=3.39) to implement ISO 9000 QMS. This supports the findings of global survey of Corbett & Luca (2002). Corbett & Luca (2002) found that documentation was perceived as the second most important factor for the ISO 9000 implementation and capital investment was perceived as the least important factor for the ISO 9000 implementation by the respondents from the countries under study.

The findings of the mean value show that the top three organizational performance improvements from the ISO 9000 implementation, as perceived by the Malaysian construction firms, are improvements in operational performances: 1) improvement of internal processes and procedure (mean=4.01), 2) increase of customer satisfaction (mean=3.97), 3) improvement of the quality of work done (mean=3.94). Two business performance indicators, market share (mean=3.19) and organization's profit (mean=3.27), are ranked as the second and the third lowest mean value in terms of performance improvement. All the mean value of organizational performance indicators are above 3 (3=moderate benefits, 4= substantial benefits). Thus, this finding supports the findings of Huarng *et al* (1999), Sun (2000), Said *et al* (2006), Terziovski & Power (2007), Bayati & Taghavi (2007),

Wu & Liu (2010) and Zaramdini (2007), indicating that the implementation of ISO 9000 QMS can improve organizational performance. From the mean value and t-tests ($t=10.02$ at $p<0.05$) analyses, the results show that the improvement of operational performance (mean=3.87) is significantly higher than the improvement of business performance (mean=3.23). As contended by Heras *et al* (2002), business performance is affected by a multitude of variables. This may be the reason why most Malaysian construction firms perceived less improvement of business performance as induced by ISO 9000 certification.

From the empirical results of correlation and regression analyses, it is confirmed that the implementation effort of ISO 9000 QMS can directly and positively affect the improvement of operational performance and business performance of Malaysian construction firms. Therefore, it can be concluded that the implementation effort of ISO 9000 QMS can directly and positively affect the organizational performance of Malaysian construction firms. It is expected that there is a significant and positive causal relationship between the implementation effort of ISO 9000 QMS and operational performance of Malaysian construction firms because ISO 9000 practices are to manage and improve the firm's operation process with emphasis on quality improvement, employee involvement, cost reduction and customer satisfaction (Jang & Lin, 2008; Prajogo, 2011). This finding also supports the findings of Han *et al* (2007), Arumugan *et al* (2008), Jang & Lin (2008), Lin & Jang (2008), Kong *et al* (2010) and Prajogo (2011) who found that ISO 9000 implementation can improve operational performance. The finding of a significant and positive

causal relationship between implementation effort of ISO 9000 QMS and business performance in this study supports the finding of Feng *et al* (2008). Feng *et al* (2008) actually found that organizational commitment and implementing procedures are the two ISO 9000 certification practices that can have positive effect on the business performance. The ISO 9000 implementation effort by a contractor can actually be observed directly by developers (client of contractor) and architects/consultants (superintendent officer of a project) during the progress of construction works. Therefore, if developers, architects and consultants observe that a contractor puts in a higher effort to implement ISO 9000 QMS, they will have more confidence on the contractor's works and more likely to appoint the contractor for the next project. This means that the market share or profits of the contractor will be increased. However, this finding contradicts the findings of Han *et al* (2007), Jang & Lin (2008), Lin & Jang (2008) and Kong *et al* (2010) who found that the operational performance mediates the relationship between ISO 9000 implementation and business performance.

The standardized Beta coefficients of implementation effort of ISO 9000 QMS in the regression model 2 and 3 as presented in Table 4.7 shows that implementation effort of ISO 9000 QMS has a stronger positive effect on the operational performance (Beta=0.63) than the business performance (Beta=0.47). This result further supports the result of t-test between improvement of operational performance and business performance as discussed above. Thus, it can be concluded that ISO 9000 implementation will

bring a higher improvement in the operational performance than in the business performance of Malaysian construction firms.

In this study, the implementation effort of ISO 9000 QMS was found to have partial mediating effect on the relationship between the motivation for certification and the organizational performance of Malaysian construction firms. This finding indicates that the positive effect of motivation for certification of a firm on its organizational performance improvement partially depends on whether or not the motivation of certification can really motivate its employees to put in the effort to implement ISO 9000 QMS. If top management cannot motivate their employees to put in more effort to implement ISO 9000 QMS, then the improvement of organizational performance induced from motivation for certification will be less. As highlighted in the study by Baron & Kenny (1986), a mediator's partial mediating effect actually indicates that there are other mediators in the relationship between the independent variable and dependent variable. Therefore, the finding of partial mediating effect of ISO 9000 implementation efforts also supports the contention of Gotzamani & Tsiotras (2001) that long term effectiveness and value of ISO 9000 standards not only depends on its requirements. As concluded by Lo (2002), after the implementation of ISO 9000 QMS, quality culture was not established in the Hong Kong ISO 9000 certified construction firms and no improvement was found in their quality of services. Therefore, quality culture can be another potential mediator between motivation for certification and organizational performance. Prajogo (2011) suggested that knowledge or learning capacity is a potential moderator for the

relationship between ISO 9000 implementation and performance. Therefore, knowledge or learning capacity of a firm can also be another potential mediator between motivation for certification and organizational performance.

This study found that the organization size does not significantly moderate the relationship between motivation for certification and the implementation effort of ISO 9000 QMS. This finding is similar to the findings by Gotzamani & Tsiotras (2001), Dissanayaka *et al* (2010) and Llopis & Tari (2003) who found that there is no difference, in terms of TQM practices and benefits gained from ISO 9000 certification, amongst organizations of different sizes.

This study also found that the length of ISO 9000 implementation does not significantly moderate the relationship between the implementation effort of ISO 9000 QMS and the organizational performance. This supports the findings by Leung *et al* (1999), Llopis & Tari (2003) and Fotopoulos & Psomas (2009a) who found that the length of ISO 9000 implementation has no effect on the costs and benefits of ISO 9000 implementation, the use of quality management tools and techniques and the performance of TQM practices.

In conclusion, the overall findings show that CIDB Malaysia has actually made the right decision to impose the regulation on the adoption of ISO 9000 certification for all the Grade G7 contractors. The implementation of ISO 9000 QMS did improve the operational and business performance of Malaysian construction firms as what CIDB Malaysia (2007) contended when they imposed the regulation. This finding supports previous studies conducted in

Malaysia by Naser *et al* (2004), Said *et al* (2006), Arumugan *et al* (2008) and Kong *et al* (2010) who found that ISO 9000 implementation can improve some or all of the organizational performance measures. The external pressure from CIDB Malaysia actually encourages more Malaysian construction firms to adopt the ISO 9000 certification because initially most of the Malaysian construction firms did not have any initiative to adopt any quality management systems. It also led to more Malaysian construction personnel, especially top management, to look into and understand how ISO 9000 standards can benefit them. Other than having a high level of external motivation for certification, Malaysian construction firms also adopt ISO 9000 certification with a high level of internal motivation for certification such as improving the efficiency of operation and quality of works. It can be concluded that Malaysian ISO 9000 certified construction firms, regardless of the organization size and length of ISO 9000 implementation, do have a high level of ISO 9000 implementation effort and these firms gain improvement in the organizational performance (which includes operational and business performance), after the adoption of ISO 9000 certification. This study also found that there is a partial mediating effect of implementation effort of ISO 9000 QMS on the relationship between motivation for certification and organizational performance. Therefore, it is important for the top management of Malaysian construction firms to know how to transform their high level of motivation for certification to the maximum effort that employees can put in for implementing ISO 9000 QMS in order to gain the maximum benefits for the organizational performance improvement.

5.2 LIMITATIONS OF THE STUDY

The first limitation of this study is that the survey is based on the subjective measure only and no objective measure is used to support the subjective measure. All the responses for the questionnaire survey are based on the perceptions of respondents and different respondents may use different standard to answer the questionnaire.

The second limitation of this study is that the measure of quality improvement or customer satisfaction is only from the perception of ISO 9000 certified construction firms. These measures should come from the response of customers of ISO 9000 certified construction firms so that the data is more precise (Kong *et al*, 2010). However, this data is not easily obtainable.

5.3 SUGGESTIONS FOR FUTURE STUDY

The following are suggested for future studies:-

- 1) Due to the difficulty in developing reliable objective measures, a qualitative survey such as case studies or interviews can be conducted to reaffirm the conclusions of this study.
- 2) The questionnaire can be improved and re-designed in order to have multiple respondents from a firm to answer so that the measurement for each variable will be more reliable (Kong *et al*, 2010).
- 3) Except for the study by Prajogo (2011), no other previous studies in the literature reviewed used causal analysis to find that external motivation for certification can directly affect the implementation effort of ISO 9000 QMS. Therefore, it is suggested to repeat the survey, with or without

any improvement to the questionnaire for the construction industry in other countries as well as for other industries in Malaysia, for further confirmation.

- 4) Based on the result of mediating effect tested in this study, it is suggested that another research is carried out to investigate the role of other potential mediators between motivation for certification and organizational performance, such as quality culture and knowledge or learning capacity.

5.4 IMPLICATIONS FOR PRACTITIONERS

The first implication for the managers of Malaysian construction firms is that both internal and external motivations for certification have a significant relationship with the implementation effort of ISO 9000 QMS. However, it is important to realize that internal motivation for certification has a higher driving effect on the implementation effort of ISO 9000 QMS than external motivation for certification has. With a higher level of internal motivation for certification, the firms will have a higher implementation effort of ISO 9000 QMS which in turn will have a better operational and business performance. To really outperform the competitors, a QMR must ensure that his firm practises the ISO 9000 QMS with a higher level of internal motivation for certification than the competitors.

The second implication for the managers of the Malaysian construction firms is that the implementation of ISO 9000 QMS can really improve their operational performance and business performance. Even though there is no

standardized product like what manufacturers have, the contractors can still implement ISO 9000 QMS successfully and improve the companies' performance. The more efforts are put in for the implementation of ISO 9000 QMS, the more improvements are made in terms of operational performance and business performance.

The third implication for the managers of Malaysian construction firms is that improvements in organizational performance cannot be fully gained with a high level of motivation for ISO 9000 certification only. The commitment and effort of employees to ISO 9000 implementation is also important in gaining improvements in organizational performance. Therefore, it is very important for managers to communicate their motivation for certification with their employees and make sure the employees are motivated to put in high efforts to implement ISO 9000 QMS and ultimately lead to better organizational performance.