

QUALITY CERTIFICATION AND COMPANY PERFORMANCE – THE NEWLY DEVELOPED COUNTRY EXPERIENCE

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Abstract. This study investigates the impacts of ISO 9001:2008 certification on companies in Malaysia. Data were collected from CEOs and managers through a questionnaire survey. A multivariate analysis and SPSS macro were used as statistical techniques to assess the effects of ISO 9001 certification. Results of the study indicate that ISO 9001 certified companies were having significantly greater benefits and financial performance compared to non-certified companies. However, no significant direct relationship between ISO 9001 certification and company's financial performance was found. A further investigation revealed that financial performance is actually directly related to quality and local and international business performance, which are significantly influenced by ISO 9001 certification. Therefore quality and business performances are involved in the mediational process between the financial performance of companies and ISO 9001 certification. The novelty of this research lies in the establishment of, for the first time, high level statistical relationship between ISO 9001 certification, its mediating factors and financial performance of companies.

Keywords: quality management, multivariate analysis, manufacturing and service companies, company performance, internal and external benefits, Malaysia.

JEL Classification: L15, L21, M00, M11, M16, M21.

Introduction

For competing in the global environment, the current market demands that companies establish and implement well-designed internal management systems according to internationally accepted management standards such as ISO 9001:2008 (Karapetrovic, Willborn 1998). ISO 9001:2008 (hereafter it will be termed as ISO 9001) standards

is a generic management system that is applicable to all companies regardless of size, type and ownership. Implementing ISO 9001 standards is believed to result in an efficient management system, leading to improved internal efficiency and quality, reduced waste and costs, which, in turn, results in a stronger financial performance (Psomas *et al.* 2013; To *et al.* 2011; Sampaio *et al.* 2011; Psomas *et al.* 2010; Kim *et al.* 2011). However, the research on the benefits of ISO9001 certification has produced confusing and uneven results across countries, and also across types and sizes of companies within the same country (Rönnbäck, Witell 2008). Moreover, none of the studies has shown the indirect impact of ISO certification on company performance. This research attempts to overcome the confusion by providing rich and statistically meaningful insights into the outcome of practicing ISO 9001. It can be mentioned here that ISO 9001 standard is under revision, with an updated version due by the end of 2015. The authors expect that some of the findings of this study will be reflected in the new version of ISO.

Malaysia has witnessed a spectacular growth in the number of ISO certificates issued with an average increase of 9.89% per annum, far exceeding the worldwide average of 2% per annum. Exceptionally high growth in ISO certification makes Malaysia particularly suitable case country to investigate the impact of ISO certification on company performance.

Many survey studies on ISO 9001 have been conducted but reported confused and uneven results on benefits of ISO 9001 across the countries and across type and size of the companies (Chikuku *et al.* 2012; Psomas *et al.* 2013; Sampaio *et al.* 2011; Psomas *et al.* 2010). The inconsistencies of the studies could be due to the population differences, methodological errors, economic, political and business environments as well as the workplace culture, and technological base. While many companies rush to be ISO 9001 certified, whether this brings expected internal and external benefits to the companies is still an open question. Thus, given the inconsistent nature of the research findings on the non-financial and financial performance of the companies due to ISO 9001 certification, more fact-based and statistically oriented studies in this area are required (Sampaio *et al.* 2011). Moreover, most of the existing studies are descriptive in nature and therefore are not based on high-level statistical analysis. To overcome the above mentioned limitations, the research focus of this study is to examine, with rich statistical analysis, the internal and external effects of implementing ISO 9001 standards on Malaysian companies.

The major point of the findings of this study is the fact that the quality and business performances are significantly involved in the mediational process which indicates that company's financial performance is not directly influenced by the certification of ISO 9001 standard, but by its level of implementation.

1. Theoretical background

The latest version of ISO9001 has become an international reference for quality requirements in business-to-business dealings. According to the recent ISO survey (ISO survey 2012), by the end of December 2011 there were at least 1,101,272 ISO 9001

valid certificates issued in 184 different countries and economies. This report shows how companies worldwide have responded to the sensitivity of the quality issue by getting ISO 9001 certification. Prevention of nonconformities and maintaining continuous improvement and customer satisfaction activities are mandatory if a company wants to maintain the ISO 9001 certified status. Consideration of customer satisfaction (CS) is an important part of ISO standard. Cockalo *et al.* (2011) developed a model for satisfying customer requirements according to ISO 9000 series of standards. They concluded that company's objective should be to achieve and understand the optimum level of CS. Ciavolino and Dahlggaard (2007) considered CS as an overall evaluation of the product or service performances and suggested that a better strategy is to reduce the expectations a little and then try to deliver more than expected. They concluded that customer loyalty is the truer measure of quality compared with satisfaction.

The benefits of implementing ISO 9001 standards can be classified into external and internal categories. The majority of studies has come to the conclusion that there is a positive relationship between the implementation of ISO standards and company's internal benefits (performance in terms of operation management, quality control, human resource management, finance, and overall management) and external benefits (local and international business performance) (Padma *et al.* 2008; Psomas *et al.* 2013; Kim *et al.* 2011). These internal and external benefits are generally considered as non-financial performance measures (Psomas, Kafetzopoulos 2014; Abdel-Maksoud *et al.* 2005). Moreover, industry sector, company size, length of certification, geographical location, the level of economic development, and national culture may influence company's financial performance due to differences in resource endowments and strategies (Manders 2015; Islam, Karim 2011; Karim *et al.* 2008). Vasileios and Moschidis (2015) found that large companies achieved better performance in the implementation of ISO9001 standards.

Although the majority of the studies carried out state that there is a positive relationship between ISO9001 certification and benefits/performance, there are also a large number of authors who did not find enough evidence to support such a direct relationship (Lee *et al.* 2009; Rönnbäck, Witell 2008; Parast, Fini 2010). The intrinsic value of the ISO9001 certification is not constant and the certificate did not prove to be the distinguishing factor for companies' performance.

In Malaysia, ISO 9001 certified companies generally reported having benefit after certification. A study conducted by Miles *et al.* (1999) found that Malaysian managers were more optimistic about future benefits, particularly marketing benefits and international trade from ISO9001 certification. In fact, it was found that the marketing advantage is one of the main benefits derived from ISO 9001 certification in Malaysia where the ISO 9001 certification process acted as a catalyst for the implementation of more efficient systems.

It can be seen that the findings of the above literature are not entirely consistent with each other. Therefore, there seems to be much room for conducting additional work. Martinez-Costa and Martinez-Lorente (2007) and Boiral and Roy (2007) also noted that

more detailed context specific studies would allow thorough examination of company's performance variables, attitudes, and understanding of the ISO 9001 standard. To address this oversight, our study examines the impact of registering ISO 9001 systems on companies by using the established scales. To date, no research has investigated the aspects of direct and indirect benefits of ISO 9001 certification in Malaysia.

1.1. Conceptual framework:

From an extensive search in the open literature, we derived a conceptual map (Fig. 1) that illustrates the expected relationships and major hypotheses.

1.2. Research hypotheses:

The hypotheses of the study in the Malaysian context are as follows:

- H1:** ISO 9001 certification is positively and significantly related to company's internal and external benefits.
- H2:** The components of benefits (quality, management, and business performances) is positively and significantly related to company's financial performance.
- H3:** H3a ISO 9001 certified manufacturing companies experience greater benefits than certified service companies.
H3b ISO 9001 certified large companies experience greater benefits than certified small & medium companies.
H3c ISO 9001 certified companies experience greater benefits than non-certified companies.
- H4:** The association between ISO 9001 certification and financial performance is mediated by internal and external benefits.

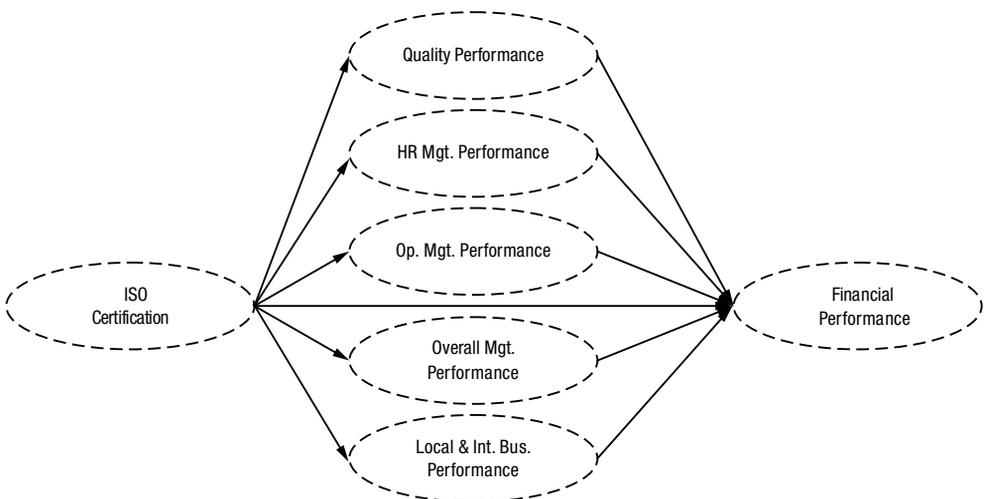


Fig. 1. Graphical presentation of the hypothesized links between ISO 9001 certification and company performances

2. Research method

Flynn's (1990) systematic approach of empirical research was used in this study. The research problems were first formulated from the literature and then a questionnaire survey was conducted to test the hypotheses.

2.1. Participants and procedure

After gaining ethical clearance, the first stage of the study was a pre-test of the instrument developed with a total of ten individuals. The group was comprised of chief executive officers and managers drawn from public and private manufacturing and service organisations, thus being a representative company population sample. Based on the pre-testing, some modifications were done to ensure the clarity of all the items in the questionnaire. Academics and professionals in the field of quality management reviewed the modified version of the questionnaire to ascertain successful adaptation. Based on their recommendations, the questionnaire was further improved in order to make it more comprehensive. The improved questionnaire was mailed to 600 (50 large, and 550 small and medium companies) randomly selected companies from different regions in Malaysia. Demographic representation was also taken into consideration as the survey attempted to cover small, medium and large companies in order to see if there is any difference and similarities between them. The number of employees is used as the proxy of indicator of company size in this study (Islam, Karim 2011). In Malaysia, the Ministry of International Trade and Industry defined small, medium and large companies as: (i) A small-scale company is a company with less than 50 full-time employees (ii) A medium-scale company is a company with between 51 and 151 full-time employees (iii) A large-scale company is a company with more than 151 full-time employees (MITI 2009).

According to department of statistics Malaysia (2011), proportion of small, medium and large companies (manufacturing plus service) are 81.4%, 10% and 8.6% respectively. In the sample selection, same proportion of companies (in terms of large and SMEs) was maintained in order to achieve demographic representation. CEOs and managers were the target respondents of this study. Two hundred one responses were received with an overall response rate of 33.5%. Although there are no absolute standards in the literature about the sample size requirements, Kline (2005) classified sample sizes in empirical studies as small ($N < 100$), medium ($100 < N < 200$) and large ($N > 200$). Sample size of this study is considered large and therefore suitable for any analysis. Moreover, the current study employed a bootstrapping method (with $n = 5000$ bootstrap resample) and used a SPSS macro developed by Preacher and Hayes (2008) to assess the indirect effects (Sobel Tests).

2.2. Measure of the constructs

Although several studies proposed instruments for internal and external performance measurements from various aspects, there were no common items for these performance measurements. In order to test whether the items used in the survey to measure the internal and external performance constructs were able to truly measure the specified constructs, an exploratory factor analysis (varimax rotation method) was carried out and the results are presented in Table 1.

Table 1. Rotated factor matrix, reliability, and validity statistics

Factors	Factor loadings	Cronbach's 'α'	AVE ¹	(r ²) ²
<i>F₁ = Local and international business performance (external benefits)</i>				
Company's competitiveness.	.755	0.891	0.449	0.318
Company's access to international markets	.736			
Company's entrance to new local markets	.730			
Receive incentives from the government	.722			
Company's customer relationship	.629			
Company's image	.550			
Company's repeat sales	.531			
<i>F₂ = Quality Performance</i>				
Reduction of defects product or service	.691	0.855	0.381	0.324
Company's product and service quality	.639			
Reduction of customer's complaints	.634			
Improvement of customer's satisfaction	.599			
Reduction of waste	.586			
Achieving the objective of company's quality assurance on its products and services	.549			
<i>F₃ = Human Resource Management Performance</i>				
Employee involvement in work (Staff motivation)	.785	0.845	0.466	0.355
Skills of employees	.724			
Accountability of employees	.707			
Communication between management and employees	.669			
Clearly define responsibility of employee	.606			
Job satisfaction	.585			
<i>F₄ = Operation Management Performance</i>				
Process performance	.753	0.833	0.468	0.355
Productivity	.706			
Guide employees to meet company objective (internal administration efficiency)	.666			
Responsibilities, obligations, and commitment of employees for on-time delivery	.603			
<i>F₅ = Overall Management Performance</i>				
Clarification of the company's objectives and goals	.631	0.834	0.326	0.324
Management's ability to fully understand and meet customer's requirements	.568			

End of Table 1

Factors	Factor loadings	Cronbach's 'α'	AVE ¹	(r ²) ²
Gain internal benefits (documentation)	.559			
Management commitment	.516			
<i>F₆ = Financial Performance</i>		0.768	0.448	0.316
Reduction of overall costs	.728			
Market share	.693			
Return of asset (ROA)	.670			
Sales growth	.643			
Profit	.608			

Notes: ¹AVE = $\sum X_i^2/n$ (number of items $i = 1, \dots, n$; X_i , factor loading); ²r², the highest squared correlation between the factor of interest and the remaining factors.

The factor analysis results in the establishment of six latent factors that can be labelled as: human resource management performance, quality performance, operation management performance, overall management performance, local and international business performance, and financial performance. The construct validity and reliability of the latent factors are confirmed, according to the suggestion of Hair *et al.* (2009), by evaluating the convergent validity (factor loadings of respective measured items >0.50), the discriminate validity (average variance extracted > squared of the correlation value) and Cronbach's alpha coefficients (lowest acceptable limit of coefficient ranges between 0.6 and 0.7). High reliability (internal consistency) of the latent factors confirmed that outcome from a study is in fact accurate.

2.2.1. Human resource management performance

Present results of factor analysis show that six items have factor loading above 0.50 and grouped into one factor, which indicates that these items are adequate to measure the human resource management related benefits. The instrument considered was justified statistically by the large correlation between six items of the benefits of human resource management ($r = 0.47$ to $r = 0.63$). The validity is confirmed by convergent validity (factor loadings of respective measured items > 0.50) and discriminant validity [AVE (0.466) > r² (0.355)]. Cronbach's α value of 0.845 indicates high level of reliability and internal consistency of the construct.

2.2.2. Quality performance

Six quality performance related items have factor loading above 0.50 and grouped as one factor which was used to measure "quality performance" construct. This was justified statistically by the large correlation between six items of "quality performance" ($r = 0.46$ to $r = 0.75$). The validity is confirmed by convergent validity (factor loadings of respective measured items > 0.50) and discriminant validity [AVE (0.381) > r² (0.324)]. Cronbach's α value of 0.855 has confirmed the reliability of the construct, which indicates that the items studied are internally consistent and each of the items is unique and not a repetition.

2.2.3. Financial performance

As shown in Table 1, the factor analysis identified five items having factor loading above 0.50 and grouped into one factor, which indicates that these items together are adequate to measure financial performance. The large correlation between five items of financial performance ($r = 0.61$ to $r = 0.72$), discriminant validity [AVE (0.448) > r^2 (0.316)] and Cronbach's coefficient alpha of 0.768 have demonstrated the validity and reliability of this construct.

2.2.4. Operation management performance

Four items in this category have factor loading above 0.50 and grouped into one factor which is used to measure composite 'operation management performance' construct. The large correlation between four items ($r = 0.51$ to $r = 0.73$), Cronbach's α value of 0.833 and discriminant validity [AVE (0.468) > r^2 (0.355)] for this construct have demonstrates high level of reliability and validity.

2.2.5. Overall management performance

The 'overall management performance' can be measured by four items having factor loading above 0.50. The validity and reliability have been statistically demonstrated by the large correlation between four items ($r = 0.45$ to $r = 0.64$), discriminant validity [AVE (0.326) > r^2 (0.324)] and Cronbach's α of 0.834.

2.2.6. Local and international business performance

Seven items of this category are having factor loading above 0.50 and grouped into one factor which can be used to measure 'local and international business performance'. The validity and reliability have been statistically justified by the large correlation between seven items ($r = 0.42$ to $r = 0.67$), discriminant validity [AVE (0.449) > r^2 (0.318)], and the value of Cronbach's α of 0.891.

2.3. Analysis techniques

A multivariate analysis was conducted on the statistical data providing a useful complement to the descriptive snapshot. For investigating mediation, it is important to make a distinction between various effects and their corresponding weights. The *total effect* (weight c) of an independent variable (IV) on a dependent variable (DV) is composed of a *direct effect* (weight c') of the IV on the DV and an *indirect effect* (weight $a*b$) of the IV on the DV through a proposed mediator (M). Weight a represents the effects of IV on M, whereas weight b is the effect of M on DV. More importantly, an indirect effect is the multiplication of the unstandardized regression weight of IV on M and the weight of M on DV. In the case of multiple mediators, it is possible to estimate total indirect effects (i. e., sum of all $a*b$ weights) as well as specific indirect effects (e.g. effects for each individual mediator). As a rigorous test of our hypotheses, we consider point estimates of indirect effects significant in the case zero is not contained in all confidence intervals. Only specific indirect effects are reported in this study, which allow for a direct comparison of the contribution of different components of internal and external benefits in the mediational process. The analysis was repeated with financial performance as the independent variable.

3. Results and analysis

3.1. Demographics

In this study, 140 (69.7%) companies were certified with ISO 9001 and rest 61 (30.3%) companies were not certified. The distribution of the size of participating companies is an important measure of their representativeness. The distribution of companies in terms of number of employees is presented in Table 2.

Table 2. Distribution of company (according to type & size)

Questions	Elements	Number & (%)
Certification status	Certified	140 (69.7)
	Non-certified	61 (30.3)
Type of company	Manufacturing	113 (56.2)
	Service	88 (43.8)
Number of Employees	<50	133 (66.2)
	50–150	48 (23.8)
	>150	20 (10.0)

The distribution of the respondent companies was compared with the national distribution reported by department of statistics (2011) to check the representative nature of the respondents. For example, as can be seen that proportion of respondents in this study from large companies (10%) and SMEs (90%) was close to the national distribution of large and SMEs (8.6% and 91.4% respectively). Therefore, it can be concluded that respondents closely represent the national distribution of manufacturing and service companies.

3.2. Descriptive statistical analysis

Correlation analysis was performed among the scales of internal and external benefits, financial performance and ISO certification in order to test proposed hypotheses H1 and H2 and result (of one-tailed significance tests) are shown in Table 3. The results reveal that a moderate positive association exists among company performance attributes and important performance areas. These attributes are positively and strongly associated with ISO 9001 certification and correlation coefficients are statistically significant at 0.01 level. *H3* was tested with an independent-samples *t*-test and results shows that there is a strong evidence ($p < 0.001$) to support that ISO 9001 certified companies reported significantly better results on both external and internal benefits (higher mean scores) than non-certified companies (Table 4). The ISO 9001 certified companies felt that certification has improved their internal process and systems which turned to yield better product quality, service, accountability, communication skills, commitment of workers, asset management, sales growth, market share, company image, marketing advantage and competitiveness and finally has produced better benefits.

Table 3. Inter-correlation between variables included in this study (N = 201)

	ISO Certification	Local & International business performance	Quality performance	Human resource management performance	Operation management performance	Overall management performance	Financial performance
ISO certification	1.000						
Local & international business performance	0.311**	1.000					
quality performance	0.441**	0.564**	1.000				
Human resource management performance	0.344**	0.552**	0.560**	1.000			
Operation management performance	0.302**	0.481**	0.514**	0.596**	1.000		
Overall management performance	0.450**	0.528**	0.569**	0.568**	0.524**	1.000	
Financial performance	0.371**	0.560**	0.562**	0.474**	0.470**	0.494**	1.000

Note: **Correlation is significant at 0.01 level (One – tailed).

Table 4. Benefits of ISO 9001 certified and non-certified companies

Benefits	Certified		Non-certified		<i>p-value</i>
	Mean	SE	Mean	SE	
Quality performance	3.93	0.540	3.33	0.640	0.000
Operation management performance	4.11	0.654	3.64	0.744	0.000
Human resource management performance	3.90	0.635	3.40	0.638	0.000
Financial performance	3.68	0.684	3.06	0.775	0.000
Overall management performance	4.05	0.547	3.40	0.702	0.000
Local & international business performance	4.03	0.569	3.62	0.586	0.000

Table 5 shows that there is no strong statistical evidence to support that manufacturing companies having greater internal benefits than service companies except the partial support for one measure: financial performance ($p = 0.022$). On the other hand, strong statistical evidence ($p = 0.034$) was found to support that manufacturing companies experienced greater external benefits than service companies. However, considering their mean values, it can be said that the manufacturing companies perceive greater internal and external benefits. Therefore, evidences suggest that regardless of company types, companies in general benefit from ISO 9001 certification.

Table 5. Effects of ISO 9001 certification classified by type of company

Benefits	Manufacturing			Services			<i>p-value</i>
	Mean	SE	Rank	Mean	SE	Rank	
Quality performance	3.79	0.064	4	3.68	0.604	5	0.273
Operation management performance	3.99	0.069	1	3.93	0.074	1	0.517
Human resource management performance	3.78	0.067	5	3.71	0.067	4	0.510
Financial performance	3.69	0.111	6	3.35	0.079	6	0.022*
Overall management performance	3.91	0.059	3	3.79	0.076	3	0.217
Local & international business performance	3.98	0.062	2	3.80	0.052	2	0.034*

Note: Significance levels for * at 0.05.

The results summarized in Table 6 suggest that ISO certified large companies reported significantly better internal benefits than small and medium companies ($p = 0.01$), except the human resource management performance. No strong statistical evidence was found to support *H3* in terms of external benefits ($p = 0.071$). Judging from their mean values, the evidence suggests that, regardless the size, companies in general benefit from ISO 9001 certification. Thus ISO 9001 certification has yielded better internal and external benefits to large companies through quality, human resource, financial and operation management, and a considerable increase in market share, and an upward sales trend.

In order to investigate whether the better performances by certified companies are actually due to ISO9001 certification, the regression analysis was conducted. In order to test hypotheses *H4*, we carried out the Preacher and Hayes (2008) method of mediation analyses and the results are presented in Table 7. The results show that the certification of ISO 9001 was positively associated with company financial performance

Table 6. Effects of ISO 9001 certification classified by size of company

Benefits	Small & Medium	Large	<i>p-value</i>
	Mean	Mean	
Quality performance	3.59	3.87	0.002**
Operation management performance	3.84	4.09	0.011**
Human resource management performance	3.68	3.81	0.183
Financial performance	3.26	3.81	0.000**
Overall management performance	3.64	3.96	0.002**
Local & international business performance	3.82	3.98	0.071

Note: Significance levels for ** at 0.01.

(*c* weights) but no strong statistical evidence was found to support this relationship ($p = 0.101$). The results also show that the ISO 9001 certification was positively and significantly ($p = 0.01$) associated with external benefits and four components of internal benefits (*a* weight). With respect to the effects of the mediator on financial performance (*b* weights), the results uncovered that external benefits and the quality performance component of internal benefits are positively and significantly ($p < 0.01$) connected to financial performance. The rest of the components of internal benefits such as the human resource management performance, operation management performance and overall management performance were associated positively but not significantly with the financial performance.

As shown in Table 7, external benefits did significantly ($p < 0.01$) and positively mediate the relationship between ISO 9001 certification and financial performance while only the quality performance scale of internal benefits was the significant mediator of the relationship between ISO 9001 certification and financial performance, as indicated by indirect effects (*a*b* weights). So the ISO 9001 certification led to greater quality performance and local and international business performance dimensions, which in turn led to greater financial performance. However, no statistical evidence was found from rest of the components of internal benefits to strongly support *H4*. Hence, external benefits and one component of internal benefits were significantly mediated the relation between ISO 9001 certification and company financial performance.

Table 7. Mediation of the effects of ISO Certification on company’s financial performance through company’s internal and external benefits (standard errors in parentheses, 5000 bootstrap samples)

IV	M	DV	Effect of IV on M (a)	Effect of M on DV (b)	Direct effects (c')	Indirect effect (point estimate) (a*b)	Total indirect effect	Total effects (c)
ISOc	QP	FP	0.609** (0.088)	0.284** (0.109)	0.188 ^{NS} (0.101)	0.173 [†] (0.070)	0.427 ^{††} (0.081)	0.615** (0.109)
ISOc	HRMP	FP	0.504** (0.098)	0.045 (0.088)		0.023 (0.044)		
ISOc	OMP	FP	0.468** (0.105)	0.117 (0.081)		0.055 (0.039)		
ISOc	OVMP	FP	0.652** (0.092)	0.042 (0.097)		0.028 (0.062)		
ISOc	LIBP	FP	0.407** (0.088)	0.367** (0.097)		0.149 ^{††} (0.051)		

Notes: ISOc = ISO 9001 certification, QP = Quality performance, HRMP = Human resource management performance, OMP = Operation management performance, OVMP = Overall management performance, LIBP = Local and international business performance, FP = Financial performance, IV = Independent variable, M = Mediator, DV = Dependent variable, NS = not significant, *[†] $p < 0.05$, **^{††} $p < 0.01$.

It is important to mention that the direct effect of the ISO 9001 certification accounted for an insignificant portion of the variance in company financial performance indicating that quality performance, and local and international business performance mediated the relations between ISO 9001 certification and financial performance. As can be seen in Table 7, the total and direct effects of ISO 9001 certification on company financial performance are 0.615 ($p < 0.01$) and 0.188 (*NS*) respectively. The difference between the total and direct effects is the total indirect effect through all the mediators with the point estimate of 0.427. Based on this result, we can claim that significant indirect effect of ISO 9001 certification on financial performance exists. Thus we can conclude that local and international business performance and quality performance are likely to be the important and significant ($p < 0.01$) mediators.

4. Discussion

The results of this study identified the real effect of ISO 9001 standard certification on company performances. The current study uncovered the mediating effects of internal and external factors on financial performance and their relationship with ISO 9001 certification. The results show that there is significant improvement in internal quality and company processes in ISO 9001 certified companies compared to non-certified companies. Therefore, this study supports the findings of the majority of previous studies (Psomas *et al* 2013; Kim *et al.* 2011). This study found that certification of ISO 9001 standards does play an important role in enabling companies in Malaysia to survive in today's highly competitive business environment by significantly improving internal quality process and systems.

As the mediating variables and independent variables are significantly correlated, it can be concluded that improvement in company's internal quality process and promotional and marketing issues are highly influenced by the certification of ISO 9001 standard. Conversely, since the mediating variables are positively and significantly correlated with dependent variable (financial performance), it means that ISO 9001 certification standard will definitely help companies to achieve better financial benefits through improvement in non-financial performance. The improvement in the elements of company culture (such as teamwork, top management commitment and strong motivation for continuous improvement) of ISO 9001 certified companies (Basir *et al.* 2011) could be the potential reason for these positive relationships.

The correlations reported here are consistent with previous studies. However, no significance direct association was found between ISO 9001 certification and financial performance, which is different from the majority of the previous studies.

Conclusions

Based on the statistical analysis, we can conclude that ISO 9001 certified companies were having significantly greater benefits and financial performance compared to non-certified companies but no significant direct relationship between ISO certification and company's financial performance was found. Manufacturing companies was signifi-

cantly ahead of service companies while large companies were enjoying significantly greater internal benefits than small & medium companies. Possible reason could be that compared to large companies, small companies have limited resources to apply the standards properly. Compared to service companies, the manufacturing companies felt that certification has led to a considerable increase in market share, and to an upward sales trend. Moreover, manufacturing companies in Malaysia have been registering and implementing ISO standards since ISO published the first edition of the standards in 1987, while service companies have been registering and implementing ISO 9000 by the year of 2000. Also in manufacturing companies, quality can easily be measured and perceived while it is not easy in service companies. The major point that differentiates this study from similar studies is the fact that the quality and business performances are involved in the mediational process which indicates that companies' financial performance is not directly influenced by the certification of ISO 9001 standard, but by its level of implementation. The relationships are statistically very significant and should act as an impetus for more companies to focus on implementation of the standard rather than just obtaining the certificate.

The study's novel findings have implications on the operations management as well as performance management literature by extending and informing the mediating effects of internal and external factors on financial performance of companies.

The study experiences from a number of limitations that future work might seek to remedy. Some selection bias may also exist, as we could not directly compare respondents with non-respondents. Moreover, our analysis is cross sectional and therefore provides only a snapshot of ISO 9001 certification at one point in time. We cannot determine whether the level of organizational financial performance increasing or decreasing due to ISO 9001 certification as we may only describe the current situation.

This study identifies some possibilities of future research. Findings would be more commendable if the study is extended to an increased sample size and cover different departments of a company to capture a wide range of company respondents. Moreover, our analysis is cross sectional and therefore provides only a snapshot of ISO 9001 certification at one point in time. If all these areas are covered in future studies, hopefully better findings will be emerged. Future research should also include the analysis of corporate culture, company structure, company strategy as a control variable and also include employee attitude and working style. Generalizability of the findings to other newly developed countries can also be tested.

References

- Abdel-Maksoud, A.; Dugdale, D.; Luther, R. 2005. Non-financial performance measurement in manufacturing companies, *The British Accounting Review* 37(3): 261–297.
<http://dx.doi.org/10.1016/j.bar.2005.03.003>
- Basir, S. A.; Davies, J.; Rudder, A. 2011. The elements of companieal culture which influence the maintenance of ISO 9001: a theoretical framework, *African Journal of Business Management* 5(15): 6028–6035.

- Boiral, O.; Roy, M. J. 2007. ISO 9000: integration rationales and organizational impacts, *International Journal of Operations & Production Management* 27(2): 236–247. <http://dx.doi.org/10.1108/01443570710720630>
- Chikuku, T.; Chinguwa, S.; Macheke, M. 2012. Evaluation of the impact of obtaining ISO 9001:2008 Quality Management System (QMS) certification by manufacturing companies in Zimbabwe, *International Journal of Engineering Science and Technology (IJEST)* 4(9): 4168–4186.
- Ciavolino, E.; Dahlgaard, J. J. 2007. ECSI – customer satisfaction modelling and analysis: a case study, *Total Quality Management & Business Excellence* 18(5): 545–554. <http://dx.doi.org/10.1080/14783360701240337>
- Cockalo, D.; Djordjevic, D.; Sajfert, Z. 2011. Elements of the model for customer satisfaction: Serbian economy research, *Total Quality Management & Business Excellence* 22(8): 807–832. <http://dx.doi.org/10.1080/14783363.2011.597583>
- Department of Statistics Malaysia (DOSM). 2011. *Economic census 2011*. Economics and Policy Planning Division, Malaysia.
- Flynn, B. B.; Sakakibara, S.; Schroeder, R. G.; Bates, K. A.; Flynn, E. J. 1990. Empirical research methods in operations management, *Journal of Operations Management* 9(2): 250–284. [http://dx.doi.org/10.1016/0272-6963\(90\)90098-x](http://dx.doi.org/10.1016/0272-6963(90)90098-x)
- Hair, J. F. Jr.; Anderson, R. E.; Tatham, R. L.; Black, W. C. 2009. *Multivariate data analysis*. 7th ed. Upper Saddle River, NJ: Prentice-Hall.
- International Company for Standardization (ISO). 2012. *The ISO Survey of Certifications – 2012*. International Company for Standardization, Geneva. <http://www.iso.org/iso/news.htm?refid=Ref1686>
- Islam, M. M.; Karim, M. A. 2011. Manufacturing practices and performance: comparison among small-medium and large industries, *International Journal of Quality & Reliability Management* 28(1): 43–61. <http://dx.doi.org/10.1108/02656711111097544>
- Karapetrovic, S.; Willborn, W. 1998. Integration of quality and environmental management systems, *The TQM Magazine* 10(3): 204–213. <http://dx.doi.org/10.1108/09544789810214800>
- Karim, M. A.; Smith, A. J. R.; Halgamuge, S.; Islam, M. M. 2008. A comparative study of manufacturing practices and performance variables, *International Journal of Production Economics* 112: 841–859. <http://dx.doi.org/10.1016/j.ijpe.2007.07.005>
- Kim, D.-Y.; Kumar, V.; Kumar, U. 2011. A performance realization framework for implementing ISO 9000, *International Journal of Quality and Reliability Management* 28(4): 383–404. <http://dx.doi.org/10.1108/0265671111121807>
- Kline, R. B. 2005. *Principles and practice of structural equation modeling*. 2nd ed. New York, NY: The Guilford Press.
- Lee, P. K. C.; To, W. M.; Yu, B. T. W. 2009. The implementation and performance outcomes of ISO 9000 in service organizations: an empirical taxonomy, *International Journal of Quality and Reliability Management*, 26(7): 646–662. <http://dx.doi.org/10.1108/02656710910975732>
- Manders, B. 2015. *Implementation and Impact of ISO 9001* (No. EPS-2014-337-LIS). ERIM PhD Series Research in Management. Erasmus Research Institute of Management (ERIM). [online], [cited 21 February 2015]. Available from Internet: <http://hdl.handle.net/1765/77412>
- Martínez-Costa, M.; Martínez-Lorente, Á. R. 2007. A triple analysis of ISO 9000 effects on performance, *International Journal of Productivity and Performance Management* 56(5–6): 484–499. <http://dx.doi.org/10.1108/17410400710757150>
- Miles, M. P.; Munilla, L. S.; McClurg, T. 1999. The impact of ISO 14000 environmental management standards on small and medium sized enterprises, *Journal of Quality Management* 4(1): 111–122. [http://dx.doi.org/10.1016/s1084-8568\(99\)80098-4](http://dx.doi.org/10.1016/s1084-8568(99)80098-4)

- MITI. 2009. *Definition of SMEs*, Ministry of International Trade and Industry, Malaysia [online], [cited 18 December 2014]. Available from Internet: http://portaluat.miti.gov.my/cms/content.jsp?id=com.tms.cms.section.Section_smidec_latestDev
- Padma, P.; Ganesh, L. S.; Rajendran, C. 2008. A study on the critical factors of ISO 9001:2000 and organizational performance of Indian manufacturing firms, *International Journal of Production Research* 46(18): 4981–5011. <http://dx.doi.org/10.1080/00207540600793299>
- Parast, M. M.; Fini, E. H. 2010. The effect of productivity and quality on profitability in US airline industry: an empirical investigation, *Managing Service Quality: an International Journal* 20(5): 458–474. <http://dx.doi.org/10.1108/09604521011073740>
- Preacher, K. J.; Hayes, A. F. 2008. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models, *Behavior Research Methods* 40(3): 879–891. <http://dx.doi.org/10.3758/brm.40.3.879>
- Psomas, E.; Fotopoulos, C.; Kafetzopoulos, D. 2010. Critical factors for effective implementation of ISO 9001 in SME service companies, *Managing Service Quality: an International Journal* 20(5): 440–457. <http://dx.doi.org/10.1108/09604521011073731>
- Psomas, L. E.; Pantouvakis, A.; Kafetzopoulos, P. D. 2013. The impact of ISO9001:2008 effectiveness on the performance of service companies, *Managing Service Quality: an International Journal* 23(2): 149–164. <http://dx.doi.org/10.1108/09604521311303426>
- Psomas, E.; Kafetzopoulos, D. 2014. Performance measures of ISO 9001 certified and noncertified manufacturing companies, *Benchmarking: an International Journal* 21(5): 756–774. <http://dx.doi.org/10.1108/bij-04-2012-0028>
- Rönnbäck, Å.; Witell, L. 2008. A review of empirical investigations comparing quality initiatives in manufacturing and service companies, *Managing Service Quality: an International Journal* 18(6): 577–593. <http://dx.doi.org/10.1108/09604520810920077>
- Sampaio, P.; Saraiva, P.; Rodrigues, A. G. 2011. The economic impact of quality management systems in Portuguese certified companies: empirical evidence, *International Journal of Quality and Reliability Management* 28(9): 929–950. <http://dx.doi.org/10.1108/02656711111172522>
- To, W. M.; Lee, P. K. C.; Yu, B. T. W. 2011. ISO 9001:2008:2000 implementation in the public sector: a survey in Macao SAR, The People's Republic of China, *The TQM Journal* 23(1): 59–72. <http://dx.doi.org/10.1108/17542731111097498>
- Vasileios, I.; Moschidis, O. 2015. The use of quality management systems, tools, and techniques in ISO 9001:2008 certified companies with multidimensional statistics: the Greek case, *Total Quality Management & Business Excellence* 26(5): 497–514. <http://dx.doi.org/10.1080/14783363.2013.856543>
- Yong, K. S. 2002. ISO 9000 implementation in the civil service of Malaysia, in *The 9th National Convention of Quality*, 3–4 October 2002, Fiji National Training Council, Fiji.

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