

Assessing the Mediating Role of manufacturing competitive strategies in the relationship of Quality Management System and Financial Performance

Faryal Jalil^{*}, Muhammad Shafiq[†], Wasimul Rehman[‡] and Muhammad Wasim Akram[§]

Abstract

The purpose of this paper is to investigate to what extent Quality Management System (QMS) impact the manufacturing competitive strategies –low cost, high quality, delivery time, flexibility and innovation - which consequently mediates the effect of QMS on financial performance. The cross-sectional data was collected from 189 Pakistan's manufacturing companies, by using questionnaire. Structural Equation Modeling was used to determine the relationship between the variables of proposed research model. The findings show that the manufacturing strategies of competitiveness strongly mediate the effect of QMS implementation on financial performance. Moreover, the operational index of quality has the strongest relationship and innovation scored relatively least strong. This paper significantly contributes in literature by providing an empirical evidence from an under researched country like Pakistan. In terms of practical implications, the study provides guidelines for practitioners about the key performance indices that need to be introduced to quantify the impact of a QMS for attaining competitive advantage.

Keywords: QMS, manufacturing competitive strategies, financial performance

Introduction

In the developed countries, manufacturing firms have adopted quality management tools to improve operational and financial performance for many decades. However, improving organizational competitiveness is very challenging for developing countries like Pakistan. ISO 9000 standard is known for maintaining Quality Management System (QMS) in the whole world (Piskar & Dolinsek, 2006). The organizations obtained the certification of ISO 9000 as quality management practice to improve their performance in order to achieve competitive

^{*} Faryal Jalil, PhD Scholar, Institute of Quality and Technology Management, University of the Punjab, Lahore Pakistan. Email: faryaljalil@hotmail.com

[†] Dr. Muhammad Shafiq, Assistant Professor, Institute of Quality and Technology Management, University of the Punjab, Lahore Pakistan

[‡] Dr. Wasimul Rehman, Incharge Department of Business Administration, GC Women University Sialkot

[§] Muhammad Wasim Akram, PhD Scholar, Faculty of Management, Universiti Teknologi Malaysia, Malaysia.

advantage (Chow-Chua et al., 2003; Hafeez et al., 2006). In Pakistan, the journey of quality has been started in 1994 and up to number of organizations have obtained ISO certification. In Asia region, Pakistan stands at second number after India with respect to number of ISO 9000 certifications (ISO Survey, 2015).

Recent studies examined the role of ISO 9000 in financial and non-financial performance and revealed inconclusive results. On one hand, research findings confirm the positive impact of ISO 9000 on financial and non-financial performance indicators while on other hand, certain studies claim absence of such relationship (Dick et al., 2008; Kampouridis et al., 2015; Sun, 2000). Therefore, the question that whether ISO 9000 helps to achieve competitive advantage is still valid. This study response to the call for more work required to explore the relationship between ISO 9000 and performance (Zhelyazkov, 2016). Therefore the purpose of this study is to investigate the impact of QMS (ISO 9000) implementation on financial performance of organization via operational strategies that are practiced in the manufacturing sector, in the context of Pakistan. Secondly, it introduces 'innovation' as one of the non-financial competitive indicators in its construct. This is a novel part of this study, as none of the previous studies on Pakistan have considered innovation, therefore, we aim to capture what role innovation is playing in operational excellence and, therefore, to attain the competitive advantage.

The bulk of the literature on competitive advantage put emphasis on the 'uniqueness' attributes of the products and service to attain differentiation, and therefore, better performance in the market (Hafeez et al., 2002). This is important as Pakistan being an emerging market needs to consider the innovation dimension along with the well-practiced operational strategies (namely, cost, delivery time, quality of product, flexibility). As the country grows, innovation increasingly expands its role in defining organization competitiveness. Moreover, it would be interesting to observe that how implementation of standard quality procedures impact innovation in an emerging market. The existing literature, however, don't capture any valid study to demonstrate this relationship. The findings of this study will significantly contribute towards the effective implementation of ISO 9000 in developing countries. Moreover, in terms of practical implications, this study provides guidelines for practitioners about the measuring points and the key performance indices that need to be introduced to quantify the impact of a QMS for attaining competitive advantage.

Literature Review & Development of Hypotheses

QMS and Financial Performance

The quality practices bring the quality improvement in the internal manufacturing process which results in better operational performance, and then influence the financial performance. Many studies have been conducted to assess the direct and indirect relationship between ISO 9000 and financial performance. The researchers who reported direct and significant relationship between them claimed that the certified firms shows a prominent improvement in sales and profit as compared to non-certified firms (McGuire & Dilts, 2008; Shafiq et al., 2017; Corbett et al., 2005; Sharma, 2005; Terziovski & Power, 2007; Aba et al., 2016; Zhelyazkov, 2016). According to Zhelyazkov (2016) quality management system ISO 9000 influence business performance significantly. Contrarily many other empirical studies failed to find relationship between them. One group of researchers who reported no relationship (Aarts & Vos, 2001; Heras et al., 2002; Lima et al., 2000; Sun, 2000), and the other reported indirect impact on financial performance through operational performance indicators (Goedhuys & Sleuwaegen, 2013; Han, Chen, & Ebrahimpour, 2007; Kafetzopoulos, Psomas, & Gotzamani, 2015). Thus, the unclear and contradictory views regarding impact of QMS on financial performance in the existing literature required additional work (Neyestani & Juanzon, 2017). Based on above discussion, the following hypothesis has been generated:
H1: Implementation of QMS has a positive effect on financial performance.

QMS and Manufacturing Competitive Strategies

The organizations adopt ISO 9000 standard as QMS on a voluntary basis to improve their competitiveness (Kafetzopoulos et al., 2015; Lushi, Mane, Kapaj, & Remzi, 2016; Poksinska & Eklund, 2006; Sroufe & Curkovic, 2008; Wahid & Corner, 2009). The organizations can gain competitive advantage by developing multiple manufacturing strategies and practices, like product quality, cost, delivery speed and reliability (Lushi et al., 2016). The studies (e.g Anh & Matsui, 2006; Bhatia & Awasthi, 2014; Han et al., 2007; Koc, 2007) assessed the relationship between quality management practices and manufacturing strategies but their findings concluded contradictory views. Like, for innovation, on one side Mangiarotti & Riillo, (2014) stated that ISO 9000 certification helps to increase the level of innovation in manufacturing sector, on other hand Neyestani & Juanzon, (2017) stated that ISO 9000 is bureaucratic in nature and restricts the innovation activities in organization. Similarly, with respect to cost, one views found that implementation of QMS helps the organization to decrease the

scrap and waste cost (Kaynak, 2003, Lushi et al., 2016). On other hand Chiarini, (2016) found that it adversely affects the performance by increasing the cost of operations. Thus, by keeping in view the contradictory views related to competitiveness priorities following hypothesis have been generated.

H2: Implementation of QMS has a positive impact on manufacturing competitive strategies

Manufacturing Competitive Strategies and Financial Performance

Organizational competitiveness variables are internal operative results whereas business performance variables are linked to financial factors such as sales, market share, profitability and growth. Literature reveals that the manufacturing performance indicators can have effect on financial performance (Acquaah et al., 2011; Cho et al., 2008; Han et al., 2007; Li, 2000). Improvement in the internal manufacturing processes of organizations enhances customer satisfaction which makes a company more competitive, resulting in greater market share and increased profits. Heras et al., (2002) and Kaynak, (2003) stated that the decrease in cost expenditures result in reduction in wastage and increase in profit. Similarly, Acquaah et al., (2011) found speed of delivery time, has significant relationship with profitability of firms. According to (Reguia, 2014) the product innovation brings improvement in profit margin, market share, whereas, process innovation shows a positive impact on elimination of quality error in process (Camisón & Puig-Denia, 2016). Based on above discussion the following hypothesis has been formulated.

H3: Manufacturing competitive strategies has positive impact on financial performance

Mediating Role of Manufacturing Competitive Strategies:

The impact of QMS on financial via non-financial operational indicators have been analyzed across the countries. Very few studies have been found that determine the relationship between QMS and financial performance through multiple operational indicators (Han et al., 2007; Herzallah, Gutiérrez-Gutiérrez, & Munoz Rosas, 2014; Jang & Lin, 2008). But none of the study found that empirically determine the relationship between QMS implementation and financial performance via manufacturing operational strategies. As Chatzoglou, Chatzoudes, & Kipraios, (2015) determine the relationship between ISO 9000 certification and the overall financial performance of certified firms via various operational and market factors. Similarly, Herzallah, Gutiérrez-Gutiérrez, & Munoz Rosas, (2014) investigated the association among TQM practices, firm performances via cost leadership and differentiation as competitive strategies in Palestine. Recently Islam et al., (2015)

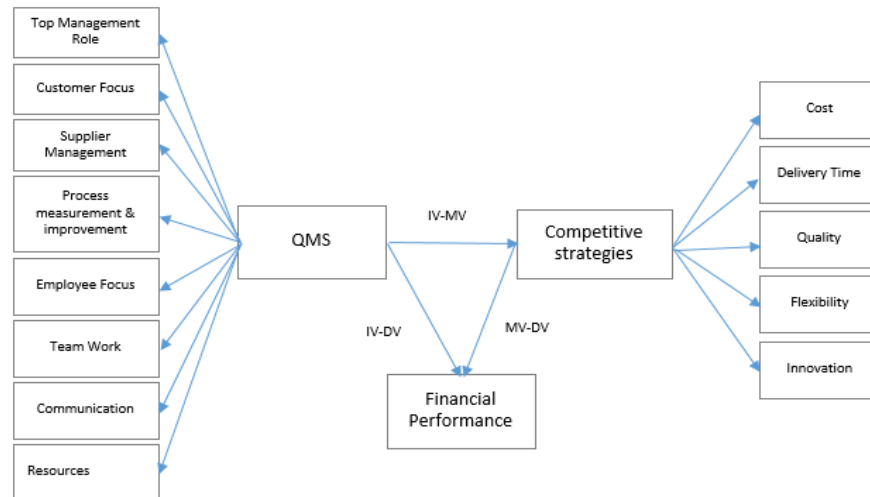
surveyed the effectiveness of ISO 9000 in Malaysia and concluded significant association of ISO 9000 with non-financial performance and insignificant association with financial performance. Similarly, Kafetzopoulos et al., (2015) analyzed 287 ISO 9001 certified Greek SMEs manufacturing firms and found that ISO 9000 directly contributes to operational performance and no direct impact on business performance. ISO implementation helps improve production process, yields marketing benefits, elevate customer and employee motivation thereby increases market share and resultantly leads to long-term financial improvement of firms. Thus based on above discussion the following hypothesis has been formulated.

H4: Manufacturing competitive strategies mediate the relationship between the QMS implementation and financial performance.

Theoretical Framework

The proposed theoretical framework, explain how the practices of QMS plays a significant role to improve manufacturing competitive strategies. And further how these strategies (reduction in cost and delivery time, improvement in quality, product flexibility, process flexibility and product innovation) improve the financial position of organization. Thus, this study aims to investigate the role of manufacturing strategies as a mediator for financial performance.

Figure 1: Theoretical Framework



H1 = QMS → Financial Performance

H2 = QMS → Competitive strategies

H3 = Competitive strategies → Financial Performance

H4 = QMS → Competitive strategies → Financial Performance

Research Methodology

Population, Sample Size and Respondents

The target population of this study was 379 manufacturing companies that are listed with Pakistan Stock Exchange (PSE). The manufacturing companies in Pakistan comprise of 21 sectors. Keeping in view the limitation of resources and time, some of the sectors; textile, food, automobile, chemicals, pharmaceuticals and constructions are selected as a sample. Among these listed companies two hundred and eighty three (283) belong to textile (175), automobile (21), food (18), chemical and pharmaceuticals (42) and construction (27) sectors. However, among these sectors textile has great significance and considered as the backbone of Pakistani economy. Around 65% of Pakistani exports are based upon the textile sector.

The respondents of this research study were the quality managers and production managers on behalf of their companies. The data collection in the developing countries like Pakistan is not an easy task thus various techniques e.g emailing google-form and personal visits have been performed to collect data from the companies. According to Saunders et al., (2012), at confidence interval of $\pm 5\%$ the minimum sample size should be 196 for population size of 400. Thus, for this study 189 companies have returned back their questionnaires and this response rate (66.8%) is sufficient.

Instrument Design

In order to measure the relationship between QMS practices, manufacturing competitive strategies and financial performance of the organization, the questionnaire based on 5 point likert scale was developed after extensive literature review. The scale of QMS based on ISO 9001:2008 criteria and the items were extracted from studies (Arauz & Suzuki, 2004; Singh et al., 2006; Yeung et al., 2003). For the performance measurement, we adopted the items for competitive strategies and financial performance from the studies of (Han, 2000; Mangiarotti & Riillo, 2014) and Feng, Terziowski, & Samson, (2008) respectively.

Sample Profile

The majority (60.1%) of the companies in sample are classified as textile, 17.7% belong to the food sector, 11.6% to automobile and rest of 10.6% belong to miscellaneous manufacturing sectors. Moreover, 14.8% of the sample companies employ less than 200 employees, 26.5% employ between 200-500 employees, 18.9% employ between 501 to 1000 and 39.3% of the company's employee above 1000 employees.

Measurement Analysis of QMS

CFA of the QMS was done by Structural Equation Modelling (SEM) using AMOS 20.0. The initial measurement model was composed of eight constructs Top Management Role (TMR), Customer Focus (CF), Supplier Management (SM), Process Measurement and Improvement (PMI), Employee Focus (EF), Team Work (TW), Communication (C) and Resources (R). According to Bienstock et al., (1997) the items which were poorly loaded on model can be deleted after CFA run. According to him the retention of one fifth items in the model is acceptable. Hence, the poorly loaded items with minimum standardized regression weights were deleted. Therefore the measurement model of the QMS construct retained with six constructs and 29 items out of 56.

In the practice of deletion of items, the two weak constructs, employee focus and team work were also deleted. This result in line with the findings of Asif et al., (2013), José Tarí & Molina, (2002) and Shafiq et al., (2014) who identified that the implementation of QMS(ISO 9000) has no influence on the satisfaction of employees. Shafiq et al., (2014) has also mapped the clauses of ISO 9001 with the TQM elements and gave evidence that QMS don't give important to employee involvement.

According to Hair et al. (2010), the value of “chi square, degrees of freedom”, “Comparative fit index CFI” and “Root Mean Square Error of Approximation RMSEA” are sufficient to assess a goodness of fit. The results show a good fit of all constructs in Table 2. The standardized factor loading values of all items are between 0.720 and 0.865, indicate that they are good because they are all above 0.5 with significant p value. The obtained trimmed model shows the adequate fit model with Chi-Square/df = 1.931, CFI = 0.910 and RMSEA = 0.070, meets the threshold values and indicates that the structural model for QMS has the best fit.

Measurement Analysis for competitive strategies

Similarly, the CFA of “competitive strategies” was done. The dimensions of organizational competitive strategies are composed of five constructs reduction in cost (cost), Delivery time (Dt), Quality of product (Qty), Flexibility (Flex) and Innovation (Inno). CFA shows the measurement model of “competitive strategies” retained with five constructs and 17 items out of 30. The standardized factor loading are between 0.723 and 0.924. The fit indices values with Chi-Square/df = 2.127, CFI = 0.943 and RMSEA = 0.077 meets the threshold values and indicates that the structural model for competitive strategies has the best fit.

Reliability and Validity Test

In order to measure the reliability and validity of the model, Cronbach’s alpha, composite reliability and average variance extracted were calculated. The Cronbach’s alpha value measures the internal consistency and must be greater than or equal to 0.7 (Pallant, 2010). The convergent validity measures through the composite reliability (CR) and average variance extracted (AVE) and their criteria is that they must be equal to or greater than 0.7 and 0.5 respectively (Hair et al., 2010). The results in Table 1 shows that the overall Cronbach’s alpha value of QMS, organizational competitiveness and financial performance were 0.963, 0.947 and 0.881 respectively. Moreover, the sub construct alpha values were also above 0.7. Therefore, these values indicate that all constructs were highly reliable. Similarly the values of CR and AVE of all construct were also meeting the criteria.

Table 1: Summary of reliability and validity test

Latent constructs (no. of items)	Factor Loadings	Cronbach’s Alpha >0.7	Composite Reliability CR > 0.7	Average Variance Extracted AVE > 0.5
Top Management Role (5)	0.87	0.876	0.877	0.589
Customer Focus (3)	0.83	0.829	0.835	0.627
Supplier Management (3)	0.88	0.816	0.819	0.601
Process measurement & improvement (7)	0.94	0.909	0.910	0.558
Communication (6)	0.86	0.895	0.896	0.591
Resource Management (5)	0.82	0.908	0.909	0.666
QMS (29)		0.963		
Cost (3)	0.75	0.876	0.823	0.54
Delivery Time (3)	0.81	0.829	0.904	0.76
Quality (6)	0.92	0.909	0.909	0.59
Flexibility (2)	0.88	0.895	0.828	0.50
Innovation (3)	0.73	0.889	0.884	0.66
Competitive strategies (CS) (17)		0.947		
Financial Performance (5)		0.881		

Structure Path Analysis and Hypotheses testing

Table 2 and Figure 2 shows the results obtained from the SEM of the proposed relationship. Kline (2011) stated that SEM is the best technique to analyze the data, when it has more than one independent, dependent and mediating variable. The goodness of fit indices of the proposed model are $\chi^2/df = 1.739$, CFI = 0.901, RMSEA = 0.063. All of these values are meeting the threshold values for satisfactory goodness of fit model defined by Kline, (2016). Therefore, these values indicate that the structural model has the best fit. In addition, the values of regression weight of QMS on competitive strategies (+0.83***)and the competitive strategies on financial performance (+0.66***)shows a strong and significant association between them as the regression values are greater than 0.5. Whereas, the regression weight between the effects of QMS on

FP become negative, weak and insignificant with value -0.06in the presence of mediator competitive strategies.

Table 2: Summary of goodness of fit model

Goodness of Fit Statistics	Measurement model for QMS	Measurement Model for CS	Structural Model	Threshold values *
χ^2/df	1.930	2.127	1.739	< 3.0
RMSEA	0.069	0.077	0.063	<0.08
CFI	0.915	0.943	0.901	>0.9
PGFI	0.678	0.641	0.639	>0.5
NFI	0.832	0.898	0.756	>0.5
GFI	0.794	0.876	0.704	Close to 1

*Byrne, (2010) and Kline (2011)

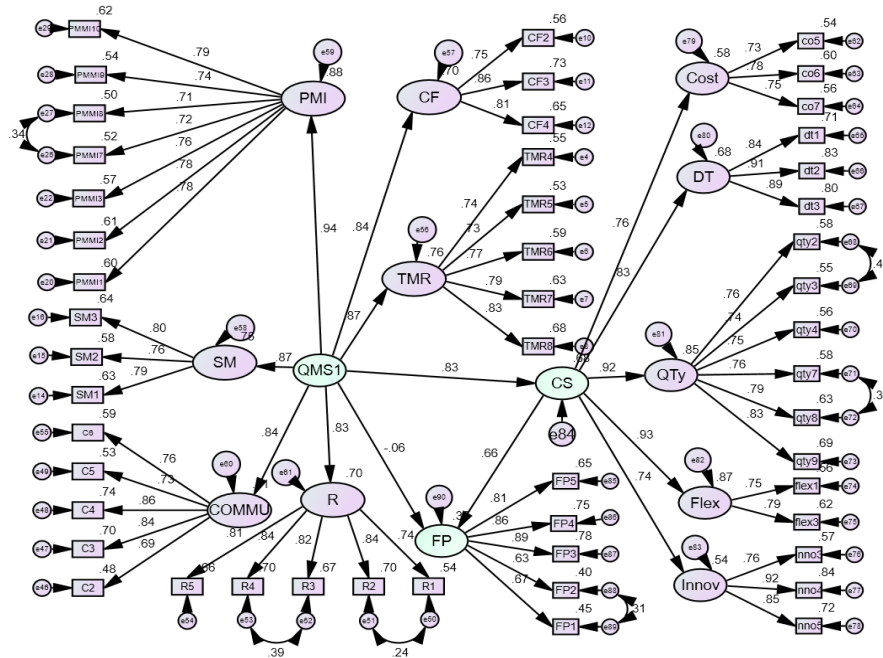


Figure 2: Structural Model for the relationship between QMS, competitive strategies and Financial Performance.

Testing of Hypotheses

Structural equation modeling was used to check the direct and indirect effects between the proposed variables.

Direct effect: to test the mediation, the first condition is to have significant direct effect of independent variable on dependent variable. Table 3 shows the direct relationship between independent variable (QMS: ISO 9000) and dependent variable (financial performance) was significant with standardized $\beta = 0.493$ at $p < 0.001$. Thus the results

supported H1 and concluded positive association between QMS (ISO 9000) and financial performance. Moreover the QMS (ISO 9000) has positive and significant impact on manufacturing competitive strategies with standardized $\beta = 0.830$ at $p < 0.001$, and the impact of manufacturing competitive strategies on financial performance was also positive and significant, with standardized $\beta = 0.660$ at $p < 0.001$. Thus the hypotheses H2 and H3 were supported.

Indirect effects: According to Hayes (2015), the indirect effect must be significant to test the mediation. Thus the bootstrapping technique is used. The results in Table 3 showed the indirect effect of ISO 9000 on financial performance through competitive strategies. (*Indirect effect* = .545, CI 95%, [0.300, 0.886], $p \leq .001$). Hence the results of this study, supported the hypothesis H4 that the competitive strategies mediates between ISO 9000 and financial performance. It is also worth noting that by entering a mediating variable “competitive strategies” the direct relationship between QMS (ISO 9000) and financial performance get reduced and insignificant with standardized $\beta = -0.060$ at $p > 0.05$. It means that the manufacturing competitive strategies fully mediates the relationship between QMS and financial performance.

Table 3: Direct Effects of Coefficients of the Hypothesized Model

Hypothesis	Path	Unstandardized Estimate	Standardized Estimate	S.E	Result
H1	QMS → FP	0.630	0.493***	0.110	Sig & Accepted
H2	QMS → CS	0.822	0.830***	0.120	Sig & Accepted
H3	CS → FP	0.850	0.660***	0.212	Sig & Accepted

Bootstrap Results for Indirect Path								
	Path	Unstandardized Estimate	Standardized Estimate	Effect	S.E	LL 95%CI	UL 95%CI	Result
H4	QM→CS →FP	-0.079	-0.060	0.545	0.184	0.300	0.886	Sig & Accepted

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$
QMS = QMS (ISO 9000 certification), CS = manufacturing competitive strategies., FP = Financial performance
Bootstrap sample size = 2000, LL = lower limit, UL = upper limit, CI = confidence interval

Discussion

The main goal of this research was to investigate empirically, the relationships between QMS, manufacturing competitive strategies and financial performance. It remains pertinent to outline that literature offers substantial research work on QMS and its impact on organizational performance (both financial and non-financial performance) but they all revealed inconclusive results. Thus this study design to examine whether the implementation of QMS (ISO 9000) bring improvement in financial performance of organization via manufacturing competitive strategies as a mediator in the context of Pakistan manufacturing organization.

Firstly, the results of direct relationship between the implementation of QMS (ISO 9000) and financial performance, showed a positive and significant impact. The result is consistent with the studies of many researchers, who claimed positive impact of QMS implementation on financial performance of organization. (Corbett et al., 2005; McGuire & Dilts, 2008; Shafiq et al., 2017; Sharma, 2005; Milé Terziovski & Power, 2007). Secondly, QMS implementation improves manufacturing operational strategies in a positive and significant way. This result is in line with previous studies (Anh & Matsui, 2006; Bhatia & Awasthi, 2014; Han, 2000; Han et al., 2007; Koc, 2007; Mangiarotti & Riillo, 2014; Kaynak, 2003)

The third finding revealed that the manufacturing operational strategies have a positive and significant effect on financial performance. This result also supported the previous studies (Han et al. 2011; Akgun, et al., 2014; Islam et al., 2015) who claimed significant impact of operational performance on financial results. The relationship between manufacturing operational strategies and performance has great importance in manufacturing sector because it emphasis on efficiency and competitiveness.

Finally, we find that manufacturing operational strategies is fully mediate between QMS and financial performance. The phenomenon that QMS practices improves the financial performance via manufacturing operational indicators sound logical in theory (Chang & Lo, 2005; Gotzamani & Tsiotras, 2002; Han et al., 2007; Islam et al., 2015; Kafetzopoulos et al., 2015). Now we can empirically claim that manufacturing operational indicators are an explanatory mechanism that helps to understand the QMS-performance relation. The fact that after introducing the manufacturing operational strategies as mediator in model the beta value between QMS and financial performance get reduced and insignificant. It means that manufacturing operational strategies are an importance indicators that play significant role in improving the financial performance of manufacturing companies in Pakistan. The significance of the results also emerge from the fact that these findings positively contribute into the important debate in the existing literature that QMS implementation brings improvement in fifth indicator of manufacturing strategies named “innovation” or not.

Moreover, the interesting finding of this study is that the two constructs; employee focus and teamwork were deleted from the measurement model of QMS. These results support the previous studies (Asif, Awan, Khan, & Ahmad, 2013; José Tari & Molina, 2002; Shafiq, Mirza, Abid, & Naeem, 2014; Sun, 2000). As Sun, (2000) has identified

no influence of ISO 9000 certification on employees' satisfaction. Moreover, Shafiq et al., (2014) mapped out the ISO 9001 clauses with the TQM elements and gave evidence that QMS don't give important to employee involvement. Hence, in-depth review of the ISO 9001:2008 and ISO 9001:2015 reveals that this standard gives less focus on employees and teamwork. Thus, the companies which mainly depend on QMS fail in setting higher levels in the area of employee focus and teamwork. However, employee focus and teamwork are the highly emphasized constructs in the literature of Total Quality Management (TQM). Thus, the organizations in Pakistan need to give more importance to these constructs because employees are key organizational stakeholders and team work is the accepted norm in the quality organizations. According to (Álvarez-García, 2016) the organization's that do not encourage and motivate the involvement of their employees in the resolution of problems, they cannot carry out the quality improvement.

At Last, the non-financial manufacturing operational indexes, used in this study figure 2 revealed that the quality has the strongest relationship (path value Qty=0.92), followed by flexibility (Flex =0.83), delivery time (Dt= 0.83), and cost (0.76). Innovation is scoring relatively least strong (Inno=0.74). However, the manufacturing companies who are implementing ISO 9000 should pay more concern on non-financial operational indexes that help the organizations to achieve competitiveness because they are the ultimate source which in turn results into higher financial performance. Especially there is a need to focus more on innovation for it has been increasingly acknowledged as a critical approach to gain sustained competitive advantage.

Conclusion and Implications

In this study, the effect of QMS practices on financial performance through mediator manufacturing strategies was examined. The findings concluded that manufacturing strategies fully mediates the relationship between QMS and financial performance. Hence, the QMS does not directly improve the financial performance of organization. In fact, the implementation of QMS enhances the competitiveness of the organization by improving the manufacturing operational indicators like reducing the cost expenditures, improving the product quality, enhancing delivery time/speed, increasing flexibility and encouraging innovation activities in organization. Later on, these indicators lead to superior financial performance of the organization. Moreover, the "manufacturing operational strategy" index of quality has the strongest relationship and innovation scored relatively least strong.

This study contributes empirically in the both theoretical and practical perspectives. From theoretical perspective, this study provides an evidence that implementation of QMS in the organizations helps to improve financial performance through the key manufacturing operational strategies in the manufacturing sector of Pakistan. Moreover it will help the academicians to introduce more strategies that will enhance the performance of organization.

From practical perspective this study will assist the organization's top management, practitioners and policy makers, to know the significance of QMS (ISO 9000) implementation. They can understand how to improve their financial position and achieve the competitiveness in an emerging market by focusing on manufacturing operational strategies.

There are few limitations of this study. First, this study focus perceptual data related to the financial performance. In future studies, it would be much better if data related to financial results could be taken from the financial reports of the companies. Third, this study is based upon the cross-sectional research design because of the time limitations. However, in future, longitudinal studies may be conducted to have in-depth understanding of the QMS effect on financial performance. Last, in future the researchers can test this relationship by considering additional variable of motivation as moderator. Because the motivation behind implementation of QMS plays a significant role to gain business competitiveness.

References:

- Aarts, F. M., & Vos, E. (2001). The impact of ISO registration on New Zealand firms' performance: a financial perspective. *The TQM Magazine*, 13(3), 180–191. <https://doi.org/10.1108/09544780110384871>
- Aba, E. K., Badar, M. A., & Hayden, M. A. (2016). Impact of ISO 9001 certification on firms financial operating performance. *International Journal of Quality & Reliability Management*, 33(1), 78–89. <https://doi.org/10.1108/IJQRM-02-2014-0021>
- Acquaah, M., Amoako-gyampah, K., & Jayaram, J. (2011). Resilience in family and nonfamily firms: an examination of the relationships between manufacturing strategy, competitive strategy and firm performance. *International Journal of Production Research*, 49(18), 5527–5544. <https://doi.org/10.1080/00207543.2011.563834>
- Álvarez-García, J. (2016). Dependency relationships between critical factors of quality and employee satisfaction. *Total Quality Management & Business Excellence*, 27(5–6), 595–612.
- Anh, P. C., & Matsui, Y. (2006). Quality Management and Competitive Performance - An empirical evident of impact of ISO 9000 in Vietnamese manufacturing companies. *Yokohama National University*, 1–23.
- Arauz, R., & Suzuki, H. (2004). ISO 9000 Performance in Japanese Industries. *Total Quality Management & Business Excellence*, 15(1), 3–33. <https://doi.org/10.1080/1478336032000149072>
- Asif, M., Awan, M. U., Khan, M. K., & Ahmad, N. (2013). A model for total quality management in higher education. *Quality & Quantity*, 47, 1883–1904. <https://doi.org/10.1007/s11135-011-9632-9>
- Bhatia, M., & Awasthi, A. (2014). Investigating Effectiveness of Quality Management Systems. In *Proceedings of the 2014 Industrial and Systems Engineering Research Conference Y. Guan and H. Liao, eds. Investigating IIE Annual Conference. Proceedings*. Retrieved from http://www.researchgate.net/profile/Manjot_Singh_Bhatia/publication/275656904_Investigating_Effectiveness_of_Quality_Management_Systems/links/5544549f0cf23ff716853ca0.pdf
- Bienstock, C. C., Mentzer, J. T., & Bird, M. M. (1997). Measuring physical distribution service quality. *Journal of the Academy of Marketing Science*, 25(1), 31–44. <https://doi.org/10.1177/0092070397251004>
- Byrne, B. M. (2010). *Structural Equation Modeling with AMOS (Basic concepts, applications and programming)*. Routledge aylor & Francis Group (Vol. 2nd Editio). <https://doi.org/10.4324/9781410600219>
- Camisón, C., & Puig-Denia, A. (2016). Are quality management practices enough to improve process innovation? *International Journal of Production Research*, 54(10), 2875–2894. <https://doi.org/10.1080/00207543.2015.1113326>
- Capmany, C., Hooker, N. H., Ozuna, T., & Tilburg, A. Van. (2000). ISO 9000 — a marketing tool for U . S . agribusiness. *International Food and Agribusiness Management Review*, 3, 41–53.

- Chatzoglou, P., Chatzoudes, D., & Kipraios, N. (2015). The impact of ISO 9000 certification on firms' financial performance. *International Journal of Operations & Production Management*, 35(1), 145–174. <https://doi.org/10.1016/j.jclepro.2016.07.215>
- Chiarini, A. (2016). Strategies for improving performance in the Italian local government organizations: Can ISO 9001 really help? *International Journal of Quality & Reliability Management*, 33(3), 344–360. <https://doi.org/10.1108/IJQRM-03-2014-0038>
- Cho, Y. J., Leem, C. S., & Shin, K. T. (2008). The relationships among manufacturing innovation, competitiveness, and business performance in the manufacturing industries of Korea. *International Journal of Advanced Manufacturing Technology*, 38(7–8), 840–850. <https://doi.org/10.1007/s00170-007-1107-8>
- Chow-Chua, C., Goh, M., & Wan, T. B. (2003). Does ISO 9000 certification improve business performance? *International Journal of Quality & Reliability Management*, 20(8), 936–953. <https://doi.org/10.1108/02656710310493643>
- Corbett, C. J., Montes-sancho, M. J., & Kirsch, D. A. (2005). The Financial Impact of ISO 9000 Certification in the United States : An Empirical Analysis. *Management Science*, 51(7), 1046–1059. <https://doi.org/10.1287/mnsc.1040.0358>
- Dick, G. P. M. (2000). ISO 9000 certification benefits, reality or myth? *The TQM Magazine*, 12(6), 365–371. <https://doi.org/10.1108/09544780010351517>
- Dick, G. P. M., Heras, I., & Casadesús, M. (2008). Shedding light on causation between ISO 9001 and improved business performance. *International Journal of Operations & Production Management*, 28(7), 687–708. <https://doi.org/10.1108/01443570810881811>
- Feng, Terziovski, M., & Samson, D. (2008). Relationship of ISO 9001:2000 quality system certification with operational and business performance: A survey in Australia and New Zealand-based manufacturing and service companies. *Journal of Manufacturing Technology Management*, 19(1), 22–37. <https://doi.org/10.1108/17410380810843435>
- Goedhuys, M., & Sleuwaegen, L. (2013). The impact of international standards certification on the performance of firms in less developed countries. *World Development*, 47, 87–101. <https://doi.org/10.1016/j.worlddev.2013.02.014>
- Hafeez, K., Siddiqi, J., & Essmail, E. (2006). Using analytical hierarchy process for evaluating organisation core competences and associated personal competencies. *Proceedings of the European Conference on Knowledge Management, ECKM*, 30(8), 192–207. <https://doi.org/10.1108/01409170710773689>
- Hafeez, K., Zhang, Y. B., & Malak, N. (2002a). Core competence for sustainable competitive advantage: A structured methodology for identifying core competence. *IEEE Transactions on Engineering*

- Management*, 49(1), 28–35. <https://doi.org/10.1109/17.985745>
- Hafeez, K., Zhang, Y., & Malak, N. (2002b). Identifying core competence...the source of sustainable competitive advantage. *IEEE Potentials*. <https://doi.org/10.1109/45.998083>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis*.
- Han, S. B. (2000). *The effects of ISO 9000 registration effort on total quality management practices and business performance*. University of Rhode Island, USA. <https://doi.org/10.16953/deusbed.74839>
- Han, S. B., Chen, S. k., & Ebrahimpour, M. (2007). The Impact of ISO 9000 on TQM and Business Performance. *Journal of Business and Economic Studies*, 13(2), 1–23. <https://doi.org/10.1017/CBO9781107415324.004>
- Heras, I., Dick, G. P. M., & Casadesus, M. (2002). ISO 9000 registration's impact on sales and profitability: A longitudinal analysis of performance before and after accreditation. *International Journal of Quality & Reliability Management*, 19(6), 774–791. <https://doi.org/10.1108/02656710210429618>
- Herzallah, A. M., Gutiérrez-Gutiérrez, L., & Munoz Rosas, J. F. (2014). Total quality management practices, competitive strategies and financial performance: the case of the Palestinian industrial SMEs. *Total Quality Management & Business Excellence*, 25(5–6), 635–649. <https://doi.org/10.1080/14783363.2013.824714>
- Islam, M. M., Karim, M. A., & Habes., E. M. (2015). Relationship between quality certification and financial & non-financial performance of organizations. *The Journal of Developing Areas*, 49(6), 119–132.
- Jang, W., & Lin, C. (2008). An integrated framework for ISO 9000 motivation, depth of ISO implementation and firm performance. *Journal of Manufacturing Technology Management*, 19(2), 194–216. <https://doi.org/10.1108/17410380810847918>
- José Tarí, J., & Molina, J. F. (2002). Quality management results in ISO 9000 certified Spanish firms. *The TQM Magazine*, 14(4), 232–239. <https://doi.org/10.1108/09544780210429843>
- Kafetzopoulos, D. P., Psomas, E. L., & Gotzamani, K. D. (2015). The impact of quality management systems on the performance of manufacturing firms. *International Journal of Quality & Reliability Management*, 32(4), 381–399. <https://doi.org/10.1108/IJQRM-11-2013-0186>
- Kampouridis, G., Yiannopoulos, A. C., Giannopoulos, G. I., & Tsirkas, S. A. (2015). The relationship between TQM and Financial performance of Greek companies of structural Construction sector during crises period. *Journal of Economics and Business*, XVIII(1), 61–78.
- Kaynak, H. (2003). The relationship between total quality management practices and their effects on firm performance. *Journal of Operations Management*, 21(4), 405–435. [https://doi.org/10.1016/S0272-6963\(03\)00004-4](https://doi.org/10.1016/S0272-6963(03)00004-4)
- Kline, R. B. (2011). *Principles and practice of structural equation modeling*. Guilford press.

- Kline, R. B. (2016). *Principles and practices of structural equation modelling*. New York, The Guilford Press.
- Koc, T. (2007). The impact of ISO 9000 quality management systems on manufacturing. *Journal of Materials Processing Technology*, 186(1–3), 207–213. <https://doi.org/10.1016/j.jmatprotec.2006.12.034>
- Li, L. X. (2000). An analysis of sources of competitiveness and performance of Chinese manufacturers. *International Journal of Operations & Production Management*, 20(3), 299–315. <https://doi.org/10.1108/01443570010294307>
- Lima, M. A. M., Resende, M., & Hasenclever, L. (2000). Quality certification and performance of Brazilian firms: An empirical study. *International Journal of Production Economics*, 66, 143–147. [https://doi.org/10.1016/S0272-6963\(98\)00031-X](https://doi.org/10.1016/S0272-6963(98)00031-X)
- Lushi, I., Mane, A., Kapaj, I., & Remzi, K. (2016). A literature review on ISO 9001 standards. *European Journal of Business, Economics and Accountancy*, 4(2), 81–85.
- Mangiarotti, G., & Riillo, C. a. F. (2014). Standards and innovation in manufacturing and services: the case of ISO 9000. *International Journal of Quality & Reliability Management*, 31(4), 435–454. <https://doi.org/10.1108/IJQRM-06-2012-0077>
- Martínez-costa, M., & Martínez-lorente, A. R. (2008). Simultaneous consideration of TQM and ISO 9000 on performance and motivation: An empirical study of Spanish companies. *International Journal of Production Economics*, 113(1), 23–39.
- Martínez-Costa, M., & Martínez-Lorente, Á. R. (2007). A triple analysis of ISO 9000 effects on company performance. *International Journal of Productivity and Performance Management*, 56(5/6), 484–499. <https://doi.org/10.1108/17410400710757150>
- McGuire, S. J., & Dilts, D. M. (2008). The financial impact of standard stringency: An event study of successive generations of the ISO 9000 standard. *International Journal of Production Economics*, 113(1), 3–22. <https://doi.org/10.1016/j.ijpe.2007.02.045>
- Neyestani, B., & Juanzon, J. B. P. (2017). ISO 9001 standard and organization's performance: A literature review. *International Journal of Advanced Multidisciplinary Research*, 4(2), 6–13. <https://doi.org/10.22192/ijamr>
- Pallant, J. (2010). *Survival Manual SPSS*. Mc Graw Hill.
- Piskar, F., & Dolinsek, S. (2006). Implementation of the ISO 9001: from QMS to business model. *Industrial Management & Data Systems*, 106(9), 1333–1343. <https://doi.org/10.1108/02635570610712609>
- Poksinska, B., & Eklund, J. a. E. (2006). ISO 9001 : 2000 in small organisations: Lost opportunities, benefits and influencing factors. *International Journal of Quality & Reliability Management*, 23(5), 490–512. <https://doi.org/10.1108/02656710610664578>
- Reguia, C. (2014). Product Innovation and the competitive advantage. *European Scientific Journal*, 1, 140–157.
- Sampaio, P., Saraiva, P., & Guimarães Rodrigues, A. (2011). The economic

- impact of quality management systems in Portuguese certified companies. *International Journal of Quality & Reliability Management*, 28(9), 929–950. <https://doi.org/10.1108/02656711111172522>
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2012). *Research Methods for Business Students. World Wide Web Internet And Web Information Systems*.
- Shafiq, M., Lasrado, F., & Hafeez, K. (2017). The effect of TQM on organisational performance: empirical evidence from the textile sector of a developing country using SEM. *Total Quality Management & Business Excellence*, 1–22.
- Shafiq, M., Mirza, K., Abid, K., & Naeem, M. A. (2014). Effect of ISO 9000 Certification on Tqm Implementation. *Journal of Quality and Technology Management*, X(II), 1–26.
- Sharma, D. S. (2005). The association between ISO 9000 certification and financial performance. *International Journal of Accounting*, 40(2), 151–172. <https://doi.org/10.1016/j.intacc.2005.01.011>
- Singh, P. J., Feng, M., & Smith, A. (2006). ISO 9000 series of standards: comparison of manufacturing and service organisations. *International Journal of Quality & Reliability Management*, 23(2), 122–142. <https://doi.org/10.1108/02656710610640916>
- Sroufe, R., & Curkovic, S. (2008). An examination of ISO 9000 : 2000 and supply chain quality assurance. *Journal of Operations Management*, 26, 503–520. <https://doi.org/10.1016/j.jom.2007.06.006>
- Sun, H. (2000). Total quality management, ISO 9000 certification and performance improvement. *International Journal of Quality & Reliability Management*, 17(2), 168–179. <https://doi.org/10.1108/02656710010304573>
- Terziovski, M., & Power, D. (2007). Increasing ISO 9000 certification benefits: a continuous improvement approach. *International Journal of Quality & Reliability Management*, 24(2), 141–163. <https://doi.org/10.1108/02656710710722266>
- Terziovski, M., Samson, D., & Dow, D. (1997). The business value of quality management systems certification Evidence from Australia and New Zealand. *Journal of Operations Management*, 15(1), 1–18.
- Wahid, R. A., & Corner, J. (2009). Critical success factors and problems in ISO 9000 maintenance. *International Journal of Quality & Reliability Management*, 26(9), 881–893. <https://doi.org/10.1108/02656710910995073>
- Yeung, A. C. L., Lee, T. S., & Chan, L. Y. (2003). Senior management perspectives and ISO 9000 effectiveness: An empirical research. *International Journal of Production Research*, 41(3), 545–569. <https://doi.org/10.1080/0020754021000033896>
- Zhelyazkov, G. (2016). Impact of ISO 9000 on Business Performance.