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The Effect of Total Quality Management on Firm Performance with the Mediating Roles of Innovation and Knowledge Management in Small Medium Enterprises

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ABSTRACT

In the present era, the policy and decision makers are quite concerned regarding quality, hence the firms are more intricate and facing questions concerning which quality management practice would be adopted to increase the firm's performance. The primary objective of this paper was to identify the effect of total quality management on firm's performance through the mediating roles of innovation and knowledge management in the SME'S of Pakistan. A sum of 280 respondents was selected for data collection from various SME'S and employing a structural equation modelling for data analysis. It was summed up that a statistically significant causal correlation has been found among the TQM, innovation, knowledge management and firm's performance. This article is established on theories like resource based theory and institutional theory. The results give cognitive understandings regarding how the modern as well as present SME's would accomplish higher performance and consistent competitiveness through the interplay of these variables in the local and international market.



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1. Introduction

In the current era, almost developed and developing nations are facing challenges and unparalleled competition in manufacturing sectors and found hard to directly participate in local and global markets. Total quality management (TQM) is well acknowledged by quality academicians and managers as a change management technique to enhance firm's performance (Baig et al., 2013). In today's practices, the term TQM refers to as a key component in gaining competitive edge particularly in developed world, however, fewer firms can afford the usage of TQM due to lack of understanding regarding the phenomenon of total quality management (Prajogo & Sohal, 2003). The basic element of firms to achieve the viable competitive edge has been converted from quality management to innovation (Soreshjany & Dehkordi, 2014), and innovation plays an integral role to accomplish TQM operation (Al-Dhaafri & Al-Swidi, 2016). Therefore, it is crucial to execute TQM practices to generate a milieu for innovation and knowledge management to introduce and improve novel goods and services to get buyer's needs and organizational success

(Soreshjany & Dehkordi, 2014). Thus, innovation mediate TQM and the organization performance to cope in the international markets (Soreshjany & Dehkordi, 2014). In the previous couple of years a considerable amount of focus has been gained by knowledge management and became the most remarkable research topic in the field of management (Lim, Mathis, & Jackson, 2010). In order to get continuous improvement different nature of firms need to promote knowledge management i.e. organizational knowledge and learning for their employees and managers (R. Y.-Y. Hung, Lien, Fang, & McLean, 2010). TQM is the basic link between organizational innovations and knowledge management. If firms can produce, manage and use organizational knowledge, they could easily maintain their competitive edge in the market (Desouza & Evaristo, 2003). In the hasty pace of technological innovations and advancements every firm is facing competitive challenges. Due to these circumstances, different practitioners and theorists of management have called for extra innovation and creativity in management practices, product lines and production processes (R. Y.-Y. Hung et al., 2010). Very few studies have attempted to test such relationship. Some researchers have used an integrated approach to assess the effect of TQM on innovation and empirically found a positive correlation between them (Sadikoglu & Zehir, 2010; Santos-Vijande & Álvarez-González, 2007). An extensive amount of empirical investigations are obligatory to identify the influence of TQM on innovation especially in manufacturing sector (Zeng, Phan, & Matsui, 2015). Now-a-days both entrepreneurs and academia has generated scholastic discussion on small and medium enterprises' (SME's) performance because it has remained a field of great concern and research (Haroon & Shariff, 2016). It is a source of contribution to gross domestic product (GDP), formation of employment opportunities and brings improvement in the livelihood of peoples. It has been examined that in developing countries SME's performance remained below the expectations level because of different factors such as uncertain economic situations, financial constraints and lack of firms financial support policies (Hafeez, Shariff, & bin Mad Lazim, 2013). In developing country like Pakistan the conditions of SME's are alike and suffering from a low growth trap (Khawaja, 2006). According to Haroon and Shariff (2016) in Pakistan SME's are striving for the success of their business and long term survival. The author further elaborated that lack of quality standards; inability to innovate and knowledge management are core issues that need to be addressed to enhance their performance.

2. Literature Review and Hypothesis Development

A comprehensive review of literature and the effect of TQM on firm's performance, innovation and knowledge management are discussed in this section. And on the basis of literature review hypotheses has also been developed.

2.1 Total Quality Management

TQM is a mingle management philosophy used to obtain the customer satisfaction by continuous improvement in the product quality and process. TQM may be defined as a set of process and methods employed to decrease or exclude variations of the production services, process in a way to develop the quality, efficiency and reliability (Antunes, Quirós, & Justino, 2017). TQM is performing a leading part in the improvement of quality management procedures and is recognized by superiors as revolution instrument in excellence as well (Arumugam, Wei Chang, Ooi, & Teh, 2009). In order to encounter the customer requirements, TQM is used as a technique to develop the efficiency, flexibility and competitiveness of the businesses by most of the firms and industries (Antunes et al., 2017). According to Terziovski and Samson (2000) it is considered as a source of consistent competitive edge for business firms. In the present perspective of highly competitive and global markets, the assessment of firm's performance has turn out to be a component of worth meaning in the improvement of firm's tactics (Antunes et al., 2017). TQM functions for bringing and managing excellence in an organization and it is not be restricted for a specified time period (Molina, Llorens-Montes, & Ruiz-Moreno, 2007). Quality management impact firm's performance substantially for the last two decades as it is a vital element for enhancing performance (FALLAHNEJAD & LORI, 2015). The development of TQM technique has connected with quality management and quality improvement activities in firm's performance continuously. According to Liao, Chang, and Wu (2010) TQM need execution for modern corporate organization and operational culture that encompass the involvement of all individuals and resource provision of a firm. Abdullah (2010) suggested that quality should be ensured at each stage of product rather than concentrating on only finished goods and products.

2.2 Innovation

The usage of modern skills, concepts, techniques and abilities that could create distinctive skills and increase the

performance and effectiveness of the business is called innovation (Andersson, Lindgren, & Henfridsson, 2008). On the other hand, Wu, Chang, and Chen (2008) defines innovation integrates any product, system, process or a concept that reflects to be unique and novel to a person. Beside this, innovation also gained popularity among firms to secure constant competitive edge in the global market (Weerawardena, O'Cass, & Julian, 2006). For getting sustainable competitive edge in the global world every organization or firm need to be competent to exploit new opportunities, ideas, protect, organize technologies, skills, resources and knowledge (Teece, 2000). Though, the strategy of innovation bears optimistic effects on firm's performance, but if an organization does not have a proper organizational structure than it is not possible to get advantage from the strategies of innovation (Din & Cheema, 2013). To improve human's daily life style an organization need to bring innovation in their products likewise, development of instruments and techniques for innovation of new product and services (Kanji & Wallace, 2000). Innovation can be categorized into two types that is, product innovation and process innovation. Both types of innovation is indispensable for every firm to meet the demands of customers and get a competitive advantage in the market (Shan, Ahmad, & Nor, 2016). The only way to come across through customer satisfaction and expectation is the launching of superior quality and innovative products in the market (Shan et al., 2016). However, fewer studies have been carried out to examine whether innovation work as a potential power for development and generation of competitive advantage needed for firm's performance (Corredor & Goñi, 2011).

2.3 Knowledge Management

Knowledge management is an effort of getting right knowledge for the right people. This knowledge is used at the right time by sharing and putting into action (Lim et al., 2010). But knowledge management nowadays gained attention in different organizations (McAdam & Leonard, 2001). In the previous two decades knowledge management has become an interesting topic to be researched. Though, most of the work related to knowledge management has been published but still many questions need to be answered (Honarpour, Jusoh, & Md Nor, 2012). The present literature shows different measurements of knowledge management in firms. Knowledge management classifies into four elements i.e. knowledge acquirement, knowledge conception, knowledge storage and knowledge transfer and usage as well (Weldy, 2009). Knowledge infrastructure ability and knowledge process ability are the two primary capabilities that every organization should require to possess for managing knowledge and improving efficiency of their employees (Tiwana, 2000). The author further suggests that organizational knowledge management involves seeking, producing new, accumulating, packing, reusing and reconfirming knowledge.

2.4 Firm Performance

The ability of firm to achieve its aims and targets with the provision of competent management, employees, and better control and a permanent dedication to get business goals effectively (Suhag, Solangi, Larik, Lakho, & Tagar, 2017). It is related to the individual or group accomplishment which is based on quality or quantity. Firm performance comprises of actual productivity of an organization and is estimated in reverse to its intended output, goals and purposes (Ho, 2008). It is a symbol which denotes how better an organization fulfill its targets. It is assumed as the basic key component in the field of management research (Ho, 2008). Practitioners perceive differently in terms of describing firm performance because majority of them applied performance for outcome (Shahzad, Luqman, Khan, & Shabbir, 2012). This construct is said to be a broader one because it involves various elements of management, operations and business excellence and activities concerned. Both indicators of financial and non-financial performance have been identified in previous research to expand insights of firm performance that is, customer satisfaction and market performance (Suhag et al., 2017).

3. Hypotheses Development

3.1 TQM, Innovation and Firm Performance

Majority of the scholars have identified significant effect of TQM on firm performance (Witjaksono, 2012). In order to enhance their business in a long run, TQM found to be a better facilitator in solving issues concerning quality and employees participation (Kaur, Singh, & Singh Ahuja, 2012). TQM is a viable management technique serves to enhance firm's effectiveness and efficiency (Kaur et al., 2012). In contrast, some empirical study highlighted that the association between TQM and firm's performance are still vague (V. H. Lee, Ooi, Tan, & Chong, 2010). Therefore, firms are required to sort and execute a proper TQM practices to retain an outstanding performance. Earlier academics have established a positive correlation between TQM and innovation (Sadikoglu & Olcay, 2014). The relationship of

both these variables have increased the curiosity among scholars in field of management (Augusto, Lisboa, & Yasin, 2014; Feng, Prajogo, Chuan Tan, & Sohal, 2006). TQM and innovation are two different constructs but both have same significance towards firm's performance. Nowadays, practitioners are trying to introduce TQM in organizations in order to bring innovation not only in human resource but also to improve organizational performance to greater extent (Bon & Mustafa, 2013; Weldy, 2009). Innovation has significant relationship with firm performance (Miranda Silva, J. Gomes, Filipe Lages, & Lopes Pereira, 2014; Prajogo & Sohal, 2001). Introduction of innovation in firm performance produce positive results such as increase in profit margin, productivity and market share (Rosenbusch, Brinckmann, & Bausch, 2011). Most of the researchers are still not clearly define the connection between innovation and firm's performance. Shan et al. (2016) corroborated that relationship of innovation with firm performance is dependent to a broader extent on several contextual factors like kind of innovation and firm age etc. Consequently, it is critical for greater understandings that whether innovation effect firm's performance or not. Firms are dire to be successful if they generate innovation and standard quality in their products. According to Prajogo and Sohal (2001) the association between TQM and innovation can be identified by firm's development and performance. Moreover, there are several suggestions linked with the effect of TQM on innovation and firm's performance and denoted a positive relationship among them (Shan et al., 2016). Based on the above literature, the following hypotheses can be proposed:

H1: TQM has a positive and significant impact on firm's performance

H2: TQM has a positive and significant impact on innovation

H3: Innovation has a positive and significant impact on firm's performance

H4: Innovation has a mediating effect on the association of TQM with firm's performance

3.2 TQM, Knowledge Management and Firm's Performance

Numerous studies have examined the factors affecting firm's performance. Among all of them TQM and knowledge management have drawn a prominent consideration in scholarly examinations (Hung, Lien, Yang & Kuo, 2011). TQM is viewed as vital management practice which is used to enhance performance of the organization (Laosirihongthong, Teh, & Adebajo, 2013). While, according to Satish and Srinivasan (2010) the impact of TQM on organization is linked with constant enhancement. This exercise adds to advance the understandings inside the firm by identifying the essential modifications in methods. TQM and knowledge management have shared purposes and positions and it reflects that both are interdependent, if not congruence (Honarpour, Jusoh, & Md Nor, 2018). Both of them are used for long-term practices for the very aim of achieving competitive edge and innovation (Honarpour et al., 2018). In recent times, some of the researchers have showed interest in the demonstrating the connection of TQM with knowledge management. Yet, they did not develop an agreement to conceptualize this association. Hung et al. (2010) reported that the relationship between knowledge management and innovation is mediated by TQM. While, Molina et al. (2007) have studied the mediating effect of knowledge transfer between TQM and performance. According Stewart and Waddell (2008) to some practitioners observed Knowledge management as a facilitator of TQM. While, Molina et al. (2007) argued that TQM facilitates the knowledge management process of an organization. Moreover, they argue that TQM predicts the knowledge management. This inappropriate and diverse outcomes empirical research emphasizes the significance of investigating this relationship more deeply. Knowledge management analyzes strategies in an organization. The findings reveal that firms can take advantage by adopting external or internal oriented knowledge management (Choi, Poon, & Davis, 2008). Knowledge management shows a complementary association, which infers synergistic impact of KM on performance (Choi et al., 2008). The balanced integrating of both the TQM and knowledge management enables firm to achieve improved performance (Afiouni, 2007). An empirically significant correlation has been found among knowledge management, quality and performance (C.-P. Lee, Lee, & Lin, 2007). In similar vein, a positive relationship has been indicated by Bogner and Bansal (2007) who highlighted that there is a significant positive relationship between knowledge management and organizational performance. The aforementioned discussion and arguments lead to formulate the following hypothesis;

H5: TQM has a positive and significant effect on knowledge management

H6: Knowledge management has a positive and significant effect on firm's performance

H7: Knowledge management mediates the relationship between TQM and firm's performance

3.3 Knowledge Management and Innovation

Academicians have established a positive connection between knowledge management and innovation (Choo, Linderman, & Schroeder, 2007). The relationship between these two variables is found to be well recognized in the literature. Using new knowledge as a source of solving issues and representing knowledge to new products is directly linked to innovation (Honarpour et al., 2018). Gaining knowledge and skills from indoor and outdoor of the firm promotes the knowledge resources within the firms, which result in to knowledge modification and subsequently this approach increase innovation (Chen & Huang, 2009). Transferring, spreading and sharing knowledge amongst the firm, involves educating and transforming current knowledge that finally maximize innovation. The usage of knowledge empowers it to be very effective and pertinent for the organization in producing standards, entailing new product formulation and performance improvement (Huang & Li, 2009). A study conducted by Johnston and Paladino (2007) and found a significant impact of knowledge management approaches on innovation exists. Several scholars have a found a positive relationship between knowledge management and innovation (Chourides, Longbottom, & Murphy, 2003; Hall & Andriani, 2003) Based on the above literature the following hypothesis can be formulated as.

H8: Knowledge management has a positive and significant relationship with innovation

4. Theoretical Foundation

In this study, a resource based theory has been used to assess how innovation can act as a foundation block for a firm by producing high level of firm's performance (Barney, 1986). On the other hand, institutional theory also proposes that, those firms which follow the norms and values of recommended practice can get high levels of productivity. Henceforth, firms for example if adopt TQM practices should be likely to have higher performance as compared to those who are not using these practices in their respective firms (Sila, 2007) Majority of the scholars identified that TQM were significantly related with firm performance (Witjaksono, 2012). TQM and innovation are two different constructs but both have same significance towards firm's performance. nowadays, practitioners are trying to relate TQM with organizations to build excellent human resource in innovation and improve organizational performance to a greater extent (Bon & Mustafa, 2013; Weldy, 2009). Numerous researchers have found the significance of the correlation between KM and innovation (Chourides et al., 2003; Hall & Andriani, 2003). While research reveals that KM result into innovation (Darroch & McNaughton, 2002). On the other hand, some scholars have investigated the association between TQM and innovation (Prajogo & Sohal, 2003). Though, less number of studies has examined the relationship of TQM, KM and innovation but the relationship reflects obvious. TQM and KM both are core management practices, appear to be diligently connected (Hsu & Shen, 2005). Knowledge management shows a complementary association, which infers synergistic impact of KM on performance (Choi et al., 2008). In the same line, Shan et al. (2016) found that the relationship between innovation and firms performance are dependent on context such as innovation kind, firm age should effect the innovation on firm's performance. Prajogo and Sohal (2001) examined the association between TQM and innovation which can be identified by firm's development and performance. In this study a proposed research framework has been developed on the basis of relationship exists among these variables that are, TQM, innovation, KM and firm's performance.

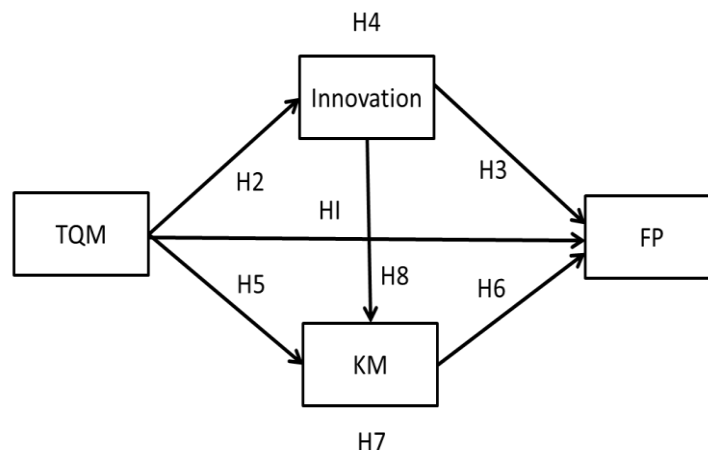


Figure 1: Proposed research framework

5. Research Methodology

This research has used a survey technique to collect samples from manufacturing sector i.e. SME’s in Pakistan and further investigation of the hypothesized effect and relationships among TQM, innovation, KM and firm’s performance. A total number of 400 questionnaires were distributed among the respondents, out of which 270 were returned back showing a response rate of 68 %. Simple random sampling technique was used in this research. All the questionnaires applied in this study were adopted from earlier studies with testified reliability and validity. The total of fifteen items have been taken from Prajogo and Sohal (2003) study to measure TQM, innovation and firm’s performance. While five items have been taken from the study of Lin and Lee (2005) to measure KM. A five -point likert scale was applied to measure the items where “1 stands for strongly disagree and 5 stands for strongly agree”. PLS-SEM was employed to evaluate the direct and indirect effect of the constructs and also assess the outer and inner models of the study.

6. Data Analysis and Results

The main purpose of this study is to identify direct and indirect relationship among the constructs. PLS-SEM was used for further analysis.

6.1 Measurement Model Assessment

Measurement model has been assessed for constructs reliability and validity. Factor loadings and composite reliability signifies the reliability of the model (F. Hair Jr, Sarstedt, Hopkins, & G. Kuppelwieser, 2014). In this study all the values of factor loadings and composite reliability is greater than the threshold value of 0.60 and 0.70 (Awang, 2015; Henseler, Ringle, & Sinkovics, 2009). Measurement model validity can be examined through convergent validity and discriminant validity. Convergent validity can be identified through factor loadings, composite reliability and average variance extracted values. This study qualifies all the acceptable limit of 0.60, 0.70 and 0.50 respectively. Cronbach’s alpha has used to measure internal consistency of an item. The recommended value for cronbach’s alpha is also 0.70. But according to Kim et al. (2004) indicators are called to be reliable if their value is equal to 0.50. In this study all the variables exceeds the limit of 0.50. All the values of factor loadings, composite reliability, AVE and cronbach’s alpha are shown in Table 1. Measurement model presented factor loadings and coefficient of determination R² values in figure 1.

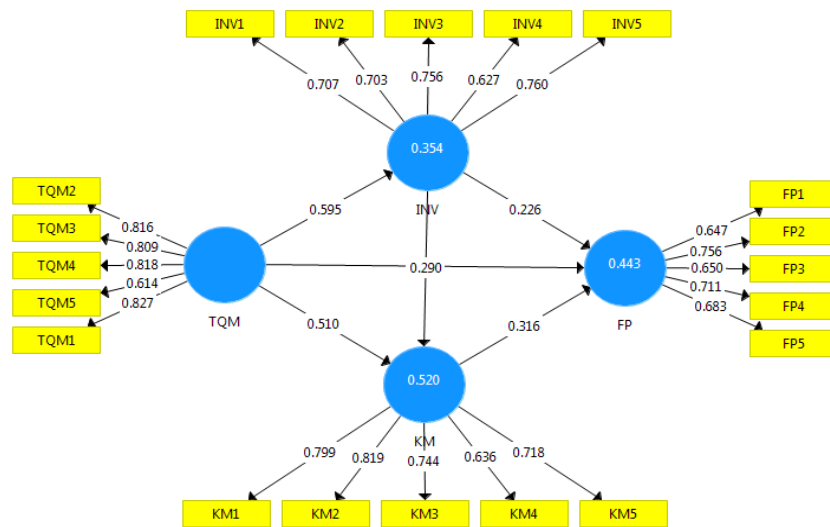


Figure 2: Measurement model

Table 1: Evaluation of the measurement model

| | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (AVE) |
|-----|------------------|-------|-----------------------|----------------------------------|
| FP | 0.734 | 0.745 | 0.819 | 0.503 |
| INV | 0.757 | 0.764 | 0.837 | 0.507 |
| KM | 0.799 | 0.813 | 0.862 | 0.557 |

| | | | | |
|------------|--------------|--------------|--------------|--------------|
| TQM | 0.838 | 0.853 | 0.886 | 0.610 |
|------------|--------------|--------------|--------------|--------------|

On the other hand, discriminant validity is measured by using Fornell-Larcker criteria Fornell and Larcker (1981), in which the square root of the AVE of a variable should be greater than the among all other variables in rows and columns and Heterotrait-Monotrait ratio (Picón, Castro, & Roldán, 2014). The acceptable value for HTMT ratio is 0.90 (Picón et al., 2014). The values of Fornell-Larcker criterion and HTMT ratio is shown in Table 2 and 3 respectively.

Table 2: Fornell-Larcker criterion

| | FP | INV | KM | TQM |
|------------|--------------|--------------|--------------|--------------|
| FP | 0.690 | | | |
| INV | 0.547 | 0.712 | | |
| KM | 0.603 | 0.594 | 0.746 | |
| TQM | 0.574 | 0.595 | 0.683 | 0.781 |

Table 3: HTMT ratio

| | FP | INV | KM | TQM |
|------------|--------------|--------------|--------------|------------|
| FP | | | | |
| INV | 0.736 | | | |
| KM | 0.725 | 0.749 | | |
| TQM | 0.678 | 0.734 | 0.816 | |

6.2 Evaluation of Structural Model

Coefficient of determination R^2 is a measure of predictive accuracy of the model (Henseler et al., 2009). This value ranges from 0 to 1 show the complete predictive accuracy. On the other hand the threshold value for R^2 is 0.75, 0.50 and 0.25 respectively which indicates significant, moderate and weak levels of predictive accuracy. Effect size is the remaining variance of coefficient of determination. Effect size is also determined in this study. The acceptable value for f^2 is 0.02, 0.15 and 0.35 which reveals small, medium and strong effect size (Hair, Sarstedt, Ringle, & Mena, 2012). Q^2 value is assessed through blindfolding technique and assumed as significant for reflective dependent variables to identify and exclude data points. The values of R^2 , f^2 and Q^2 values are indicated in Table 4, 5 and 6 respectively.

Table 4: coefficient of determination R2

| | R Square |
|------------|-----------------|
| FP | 0.443 |
| INV | 0.354 |
| KM | 0.520 |

Table 5: f2 values

| | FP | INV | KM | TQM |
|------------|--------------|--------------|--------------|------------|
| FP | | | | |
| INV | 0.053 | | 0.113 | |
| KM | 0.086 | | | |
| TQM | 0.043 | 0.549 | 0.350 | |

Table 6: Q2 values

| | Q² (=1-SSE/SSO) |
|------------|-----------------------------------|
| FP | 0.176 |
| INV | 0.161 |
| KM | 0.264 |
| TQM | |

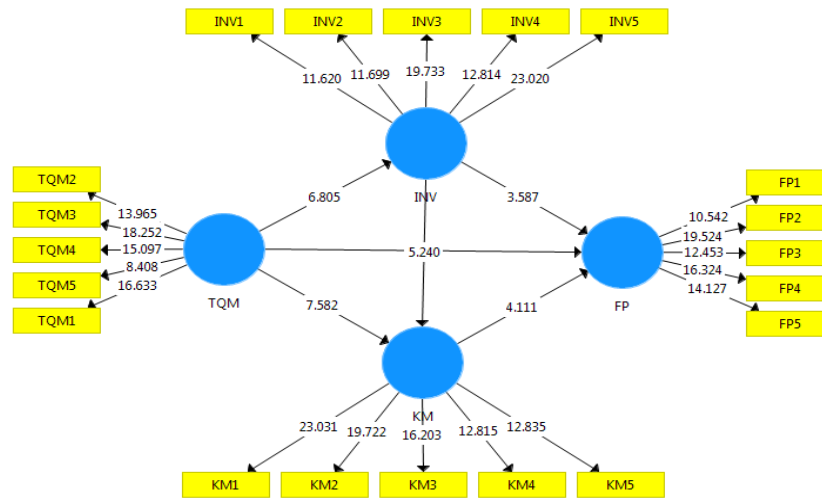


Figure 3: Structural model

6.3 Hypothesis Testing

Hypothesized relationships among the variables are measured through PLS-Bootstrapping in structural model and also as individually to find the accurate results. Figure 3 gives the path coefficient estimates and t-values for significance level. Path coefficient values range from -1 to +1, the value closer to +1 indicates strong positive association, while the value closer to -1 shows strong negative relationship. Table 7 describes the values of path coefficient, mean, standard deviation, t-values and p-values of all hypothesized direct relationships among the constructs.

Table 7: Path coefficient, t-values, means, standard deviation and p-values

| | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (O/STDEV) | P Values |
|------------|---------------------|-----------------|----------------------------|--------------------------|----------|
| INV -> FP | 0.226 | 0.226 | 0.063 | 3.587 | 0.000 |
| INV -> KM | 0.290 | 0.289 | 0.055 | 5.240 | 0.000 |
| KM -> FP | 0.316 | 0.318 | 0.077 | 4.111 | 0.000 |
| TQM -> FP | 0.224 | 0.219 | 0.076 | 2.943 | 0.003 |
| TQM -> INV | 0.595 | 0.588 | 0.087 | 6.805 | 0.000 |
| TQM -> KM | 0.510 | 0.505 | 0.067 | 7.582 | 0.000 |

In H1 the findings show that TQM has a significant and positive effect on the firm’s performance (path coefficient = 0.224, t-value = 2.943). This hypothesis is supported by the statistical data. Table 7 identifies the direct effect of TQM on FP.

In H2 the findings clearly indicate a positive and significant impact of TQM on innovation (path coefficient = 0.595, t-value= 6.805) and is subsequently verified by the statistical data. Table 7 shows the direct effect of TQM on innovation.

In H3 these findings reveal that innovation has a significant impact on firm’s performance (path coefficient= 0.226, t-value= 3.587) which is supported by empirical data. Table 7 exhibit that innovation has a direct effect on firm’s performance.

In H4 the results of this hypothesis also indicates that TQM has also impacted knowledge management positively and significantly (path coefficient= 0.510, t-value= 7.582), and is supported by the statistical data. Table 7 signifies that TQM has a direct impact on KM.

In H6 the findings shows that KM positively and significantly affected firm’s performance (path coefficient= 0.316, t-value= 4.111), and it is also verified by statistical data. Table 7 presented that KM has a direct impact on firm’s performance.

In H8 it is revealed from the results that KM is significantly and positively correlated with innovation (path coefficient= 0.290, t-value= 5.240). It is confirmed by empirical data as well. Table 7 describes that KM has a direct impact on innovation.

6.4 Mediation Analysis

To investigate the mediating effect of both innovation and KM between TQM and firm's performance. PLS-SEM was employed to proceed with the mediation analysis. Two hypotheses were developed on the basis of mediation. In PLS-SEM mediation is assessed through bootstrapping method in which direct effect and specific indirect effect among the construct is examined. In H4 it was hypothesized that Innovation mediates the relationship between TQM and firm's performance (path coefficient= 0.134, t-value= 2.962). These results also show that this hypothesis is supported by the statistical data. In H7 it was proposed that Knowledge management mediates the relationship between TQM and firm's performance (path coefficient= 0.161, t-value= 3.962). From the findings it is clearly revealed that KM mediates such relationship and it is also supported by the data. Table 8 displays the specific indirect effect of innovation and KM on firm's performance. These values explicitly show that both innovation and KM significantly mediates the relationship of TQM and firm's performance.

Table 8: Mediation hypothesis (specific indirect effect)

| | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (O/STDEV) | P Values |
|------------------|---------------------|-----------------|----------------------------|--------------------------|----------|
| TQM -> INV -> FP | 0.134 | 0.134 | 0.045 | 2.962 | 0.003 |
| TQM -> KM -> FP | 0.161 | 0.160 | 0.044 | 3.655 | 0.000 |

7. Discussion and Conclusions

The interdependency of TQM, innovation, KM and firm's performance is vital to give a concrete platform for Pakistan SME's for good perception and deeper understanding to the constructs. The aim of this model is to identify how manufacturing sector particularly SME's attains the viable competitive edge through mediating effects of innovation and KM between TQM and firm's performance. Former academics identified inconsistent link between TQM and firm's performance. Therefore, mediator role in such relationship was found essential. This framework has been suggested for future researchers to understand the significance of such relationships and advance companies to shape their effectiveness and capability complete with innovation and KM to get a higher retainable competitive advantage in the international market. It is also equally imperative to get benefit of the knowledge era and its practice which adds success to firm's performance by applying TQM. Most of the reviewed literature both theoretically and empirically shows that both TQM and KM leads to enhancing firm's performance. the findings of this study verify the results of the Ju, Lin, Lin, and Kuo (2006) that TQM and KM have a significant relationship. The results of this study in is in congruence with the previous authors stated that TQM has a significant relationship with firm's performance and innovation (Bon & Mustafa, 2013; Witjaksono, 2012). While, the relationship between KM and innovation was also found positive and significant and endorse the findings of the earlier researchers in the literature (Chourides et al., 2003; Hall & Andriani, 2003). Knowledge management shows a complementary association, which infers synergistic impact of KM on performance (Choi et al., 2008). By integrating TQM with knowledge management will help progress in firm's performance (Afiouni, 2007). In the last, a significant association has been found between KM and firm's performance by Bogner and Bansal (2007). Lastly, it is indicated that specifically in the manufacturing sector such as SME's, there is an extensive need of using TQM practices and KM to boost firm's performance. Nowadays every sector is facing the same issue in developing countries. Innovation and KM are both can be used to enhance the morale of the employees and achieve competitive advantage in the long run which can lead to higher firm performance. TQM and innovation can also replicate an important effect towards firm performance by empowering a superior place in the global and domestic market and also advance a superior performance and competitive advantage.

8. Limitations and Future Recommendations

This research carries certain limitations. The focus of this study was on manufacturing sector specifically SME'S and disregard other favorable sectors. Small sample size has been collected for data collection. This study employed TQM as a whole and ignores other factor that might produce more appropriate outcome. The presence of other manufacturing and services firms will make the study more viable. This study also bears some future directions. To enhance the firm performance this study has significantly identified the role of innovation and KM. the concerned leaders must decrease the barriers that make employees to be concerned. The future researchers should study the other significant factors that fuel the firm's performance i.e. leadership role, training and development, employee job performance with these constructs to further strengthen the results and research.

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