Total Quality Management, Firm Performance, and The Moderating Role Of Competitive Intensity

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Abstract — **By integrating resource-based view and theory of quality management we evaluated the moderating role of competitive intensity on the link between total quality management (TQM) implementation and SME performance. Using a stratified random sampling, 357 self-administered questionnaires were distributed to owner-managers of SMEs operating in Kano and Kaduna in the north-west geopolitical zone of Nigeria. Of the 714 questionnaires distributed, 440 unusable questionnaires with 57 percent responses were returned and further analysed. The hypotheses were tested using Partial least squares structural equation modeling. Results supported the hypothesised main effect of TQM implementation on SME performance. However, our empirical study revealed that competitive intensity does not moderate positive relationship between TQM implementation and SME performance.**

I. Introduction

The contributions of small and medium-sized enterprises (SMEs) to economic growth of developed and developing countries have been acknowledged in the literature (Fiseha & Oyelana, 2015; Mojikon, Abdullah & Shamsuddin, 2017; Osman & Ngah, 2016). According to Muller, Gagliardi, Caliandro, Bohn, and Klitou (2014), almost 30 percent of Gross Domestic Product (GDP) of the European Union member states are contributed by SMEs. Relatedly, the contribution made by SMEs to the GDP and employment of high income countries, such as Australia, Austria, Canada, and Germany, were 55 percent and 65 percent, respectively. It is also estimated that in the United Kingdom (UK), SMEs contribute 60 percent to total employment and about47 percent of all private sector turnover (Department for Business Innovation & Skills, 2015).

In Southeastern Asia, SMEs are integral to ASEAN economic integration, providing approximately 80 percent of employment, and contributed as much as 50 percent to the GDP, as well as significantly constituting more than 96 percent of enterprises in the region (Aziz, 2015). In Nigeria, SMEs contribute almost 50 percent of the national GDP in recent years (Oni, 2017). In the same vein, compared to the countries having the same levels of development with Nigeria, such as South Africa, Ghana, and Kenya, among others; SMEs contribute a much higher proportion to GDP than currently observed in Nigeria. For example, while SMEs in Nigeria contribute 48 percent of the country's GDP in 2015, in South Africa, Ghana, and Kenya, SMEs contribute about 55 percent, 70 percent and 98 percent of the countries' GDPs, respectively (Kenya Private Sector Alliance, 2016; Laary, 2016; PricewaterhouseCoopers, 2015; Ramell, 2016).

Although Nigeria remains Africa's biggest economy, evidence has shown that business enterprises,

including SMEs have been facing challenges, such as lack of competent management, intense competition, low demand for product and service lack of financial support, lack of training and experience, unfriendly business environment, and limited capacity for innovations, among others (Aigboduwa & Oisamoje, 2013; Ekpenyong & Nyong, 1992; Okpara, 2011; Osotimehin, Jegede, Akinlabi & Olajide, 2012; Shehu & Mahmood, 2014). Therefore, given the aforementioned statistics and issues, it will be pertinent to understand the underlying factors that affect SME performance.

Kober, Subraamanniam, and Watson (2012) observed that lack of total quality management (TQM) adoption may be a fundamental factor responsible for poor financial performance of SMEs. Ou-Yang, and Tsai (2013) emphasized the need of TQM implementation for improving operations performance multinational corporations in China. A number of other empirical studies have also demonstrated the important role of TQM implementation for improving the performance of business enterprises (e.g., Claver & Tarí, 2008; Herzallah, Gutiérrez-Gutiérrez & Munoz Rosas, 2013; Kaynak, 2003; Nair, 2006; Vanichchinchai & Igel, 2011). Taken together, while there are many factors that affect SME performance in Nigeria, total quality management has been chosen as the key independent variable because literature indicated absence of a study examining the cumulative influence of these factors, which complement and enhance each other on the performance of small and medium enterprises.

Accordingly, the purpose of this study was to examine whether competitive intensity would moderate the relationship between total quality management, and performance in Nigerian manufacturing SMEs. To this end, we provide a detailed review of literature of literature toward the development of a theoretical model that explains competitive intensity as a boundary condition between TQM and overall performance of SMEs. Hence, conceptual model was explained from resource-based and contingency perspectives. We then describe the methodology employed in this study. Next, empirical results are presented before the discussion of results.

II. Theory and Hypotheses

A. *TQM implementation and SME performance*

Many research has demonstrated that total quality management practices may enhance organizational performance. For example, Powell (1995) in a three phases empirical research concluded that firms adopting total quality management has a potential to achieve sustainable competitive advantage. Demirbag, Koh, Tatoglu, and Zaim (2006) found support for a positive relationship between TQM and firm performance with a sample of 141 SMEs operating in the Turkey textile industry. Vinod, Franck, Danuta de, and Uma (2009) provided empirical evidence indicating that implementation of TQM can enhance the performance of entrepreneurial firms in terms of customer satisfaction, employee relations, operating procedures, and increased profitability. Consistent with prior research, Christos and Evangelos (2010) reported that TQM factors (i.e., employee involvement, quality practices of top management, process and data quality management, quality tools and techniques, and customer focus) had significant positive relationships with organizational performance. According to Akgün et al's (2013), implementation of TQM helps firms to achieve sustainable bottom line performance. Recent studies have also reported that TQM significantly enhanced firm's performance across different research contexts (e.g., Jyoti, Kour & Sharma, 2017; Parvadavardini, Vivek & Devadasan, 2016; Shafiq, Lasrado & Hafeez, 2017; Singh & Maddulety, 2017). Consistent with above discussion, the following hypothesis is advanced:

H1: There will be a positive relationship between TQM implementation and SME performance.

B. *Competitive intensity as a moderator*

Given that competitive intensity is one of the underlying dimensions of external business environment, evidence supporting the role of competitive intensity as a moderator would be largely drawn from business environment literature. Past research suggests that competitive intensity plays a crucial role in determining organizational performance. For example, Ramaswamy (2001) has contributed to the literature by investigating the moderating effect of competitive intensity on the relationship between ownership and performance of large manufacturing firms across both public and private sector in India. Results of their empirical analyses revealed that the relationship between ownership and performance is contingent upon the intensity of competition. Additionally, Li, Lundholm, and Minnis (2011) showed that firm's future profitability and stock returns are negatively influenced by the increase in the level of competitive intensity. Lahiri (2013) established that competitive intensity buffered the relationship between firm resources and firm performance, such that this

relationship is weakened as competition in the industry decreases. Extant theoretical and empirical research also suggest that competitive intensity can strengthen the effect of TQM implementation on SME performance when firms in the same industry employ competitive strategies (e.g., continuous improvement and quality planning) to retain existing customers (Anderson, Rungtusanatham, Schroeder & Devaraj, 1995; Kumar, Jones, Venkatesan & Leone, 2011; Wang, Chen & Chen, 2012). Consequently, adopting TQM becomes a barrier to entry for those competing firms that do not implement TQM, and this makes TQM oriented firm to achieve sustainable performance (Kumar *et al.*, 2011). Given the aforementioned theoretical and empirical research, we advanced the following hypothesis:

H2: The effect of TQM implementation on SME performance will be moderated by competitive intensity.

III. Method

A. Sample and procedure

In the present study, surveys were distributed to 714 SMEs operating in Kano and Kaduna, the northwest geo-political zone of Nigeria. Kano and Kaduna states are selected for this study because they have high concentration of business enterprises in the northwest geo-political zone of Nigeria. We specifically involved owners and managers of SMEs in the present study because they are the most informed about firms' strategies and capabilities (Sciascia, D'Oria, Bruni & Larrañeta, 2014), and could therefore respond to the research issues and the information sought accurately (Zahra & Covin, 1995). Additionally, owners and managers were chosen to complete the self-administered questionnaire on behalf of their firms because decisions regarding the strategic decision making activities of smaller firms rest very much in the hands of these individuals, and could therefore stand in a better position to respond to the survey correctly (Naldi & Davidsson, 2014). Of 714 owners and managers of SMEs who received questionnaires, 408 usable surveys were returned, yielding 57% response rate survey (Table 1). Harman's single-factor test established that common method did not influence our conclusion as principal components factor analysis indicated that total variance for the first factor was only 32% (MacKenzie & Podsakoff, 2012; Podsakoff, MacKenzie & Podsakoff, 2012).

B. Measures

Total Quality Management: To measure total quality management in this study, we used the seven-item scale developed by Chenhall (1997). Measurement items were anchored using the seven-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). The reliability coefficient for this scale was .88. A sample item included the sentence "Our firm strongly encourages involvement of employees in quality improvement programmes".

Competitive intensity: In this study, competitive intensity was measured using Jaworski and Kohli's (1993) six-item competitive intensity scale, which includes the phrase "Our competitors are relatively weak". Individual items were anchored using the seven-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). The internal consistency coefficients for this scale was .93.

Organizational performance: Six-items were used to assess a broad range of SME performance indicators. Five items were adapted from the work of Powell (1995), and the remaining item were drawn from the work of Baker and Sinkula (1999). Examples of these items is: "Over the past 3 years, our revenue growth rate has exceeded our competitors". Items were anchored using the seven-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). Cronbach's Alpha was 0.88 for organizational performance scales, suggesting good reliability.

Table 1: *Surveyed Firms' Characteristics*

	Frequency	**Percentage**
Ownership		
Sole proprietorship	45	11.0
Partnership	141	34.6
Limited Liability Company	222	54.4

Firm size

Less than 50 employees	17	4.2
50-99 employees	215	52.7
100-249 employees	87	21.3
250-499 employees	48	11.8
500 or more employees	41	10.0

Industry

Food and beverages	104	25.5
Packaging/containers	32	7.8
Metal and metal products	35	8.6
Printing and publishing	176	43.1
Agro-allied, furniture	29	7.1
Building materials	9	2.2
Others	23	5.6

Firm age

3 – 6 years	36	8.8
7 – 9 years	79	19.4
10 – 12 years	73	17.9
13 years or more	220	53.9

IV. Results

The structural equation model in this study was estimated using PLS path modeling in conjunction with Smart PLS 3.0 software (Ringle, Wende & Becker, 2015). The PLS path modeling was considered appropriate technique of data analysis for several reasons. First, the PLS path modeling is considered to be suitable data analysis technique in this study because it can simultaneously assess the measurement model, which describes the link between theory (latent constructs) and data (corresponding indicators) as well as relationships among constructs, also called the structural model (Hair, Hult, Ringle & Sarstedt, 2017). Second, the goal of the present study is to predict the effect of total quality management, and competitive intensity on the performance of SME. Hence, the present study is causal-predictive in nature where a complex model with many variables, indicators and relations will be tested. This kind of complex model requires a path modeling approach to be employed because several researchers (e.g., Hair, Hollingsworth, Randolph & Chong, 2017; Hair, Hult, *et al.*, 2017; Hair, Matthews, Matthews & Sarstedt, 2017) have recommended the use of PLS path modeling when the goal of research is to predict the dependent variable. Third, PLS path modeling has been successfully used in the past empirical studies related to SME performance (e.g., Carraresi, Mamaqi, Albisu & Banterle, 2016; Lechner & Gudmundsson, 2014; Pratono & Mahmood; Vlasov, Bahlmann & Knoben, 2016). Finally, since this study incorporates total quality management, and SME performance in the research model, the use of PLS-SEM is considered preferable to the more popular multiple regression analysis using SPSS statistics or covariance-based techniques using AMOS because latent variables scores from the measurement model results can be used to build a subsequent PLS-SEM model with higher order constructs. Roldán and Sánchez-Franco (2012), noted that PLS-SEM would be the best option if the researcher needs to use latent variables scores in subsequent analysis, such as building higher order constructs from the scores.

A. Measurement model

In the present study, measurement model was evaluated for reliability and validity. Reliability and validity are two important criteria for evaluating the quality of measures (Andrew, Pedersen & McEvoy, 2011; Kimberlin & Winterstein, 2008). Reliability has been defined as the consistency or stability of measure each time it is administered (Hays & Revicki, 2005). Reliability is usually ascertained at the individual indicator level or at a given construct level (Götz, Liehr-Gobbers & Krafft, 2010; Im & Grover, 2004). Because the present study employed partial least squares structural equation modeling (PLS-SEM), the measurement scales was

evaluated on the basis of individual item reliability, internal consistency reliability, convergent validity, as well as discriminant validity (Hair, Hult, *et al.*, 2017; Hair, Matthews, *et al.*, 2017). The full Measurement model was presented in Table 2.

We evaluated individual items reliabilities based on standardized loadings for each of the latent constructs (Hair, Hollingsworth, et al., 2017; Hair, Hult, et al., 2017; Hair, Matthews, et al., 2017). According to Carmines and Zeller (1979), the reliability of an individual item is confirmed when its standardized loading is 0.707 or higher. Inspection of standardized loadings for individual items suggested that 3 of the original 19 items had loadings below 0.707 (See Table 2). Subsequently, these items were deleted from measurement model because they were not within the recommended threshold (Carmines & Zeller, 1979). Thus, the retained items in the measurement model were deemed reliable.

In this study, construct reliability was determined based on composite reliability coefficient (Hair, Hollingsworth, *et al.*, 2017; Hair, Matthews, *et al.*, 2017). According Hair, Ringle, and Sarstedt (2011), a satisfactory construct reliability is established when the composite reliability (CR) index 0.70 or higher. Therefore, it can be seen in Table 3 that the composite reliability indices of all latent constructs were between 0.912 and .0.943. This suggests that satisfactory construct reliability is achieved because the composite reliability indices reported in this present study were above the acceptable cut-off point of 0.70.

Literature on PLS-SEM indicates that convergent validity is ascertained using the average variance extracted (Hair, Matthews, et al., 2017). To achieve adequate convergent validity, Fornell and Larcker (1981) recommended that AVE values should be 0.50 or higher. As indicated in Table 2, AVE values ranged between 0.686 and 0.735, and all latent constructs demonstrate AVE values higher than the recommended threshold of 0.50. Hence, it can be concluded that adequate convergent validity has been established in the present study.

The present study also used Fornell-Larcker criterion approach to establish discriminant validity. Fornell-Larcker approach involves comparing the square root of AVEs with the correlations between constructs extracted (Hair, Matthews, et al., 2017). Additionally, adequate discriminant validity is achieved if, the diagonal elements are significantly greater than the off-diagonal elements in the corresponding rows and columns. The results of the discriminant validity analysis using Fornell-Larcker criterion are reported in Table 3. Following Hair, Matthews, et al. (2017), adequate discriminant validity has been established in the present study because the square root of AVEs were greater than the correlations between constructs .

Table 2: *Measurement Model Results*

Latent constructs and items	Loadings	CR	AVE
Total Quality Management		0.943	0.735
TQ01	0.897		
TQ02	0.883		
TQ03	0.888		
TQ04	0.900		
TQ05	0.838		
TQ06	0.724		
Competitive intensity		0.912	0.721
CI01	0.860		
CI02	0.887		
CI03	0.843		
CI04	0.803		
SME performance		0.929	0.686
FP01	0.824		
FP02	0.815		
FP03	0.855		
FP04	0.823		
FP05	0.812		
FP06	0.839		

Table 3: *Results of Discriminant Validity Based on Fornell-Larcker Criterion*

	Latent Construct	1	2	3
1	Total quality management	-0.244	**0.857**	
2	Competitive intensity	-0.474	0.557	**0.849**
3	SME performance	0.615	-0.317	-0.718

Note: "Diagonal elements are the square root of the variance shared between the constructs and their measures (AVE). Off-diagonal elements are the correlations among constructs".

B. Structural model

Following Hair, Hult, et al. (2017), we applied bootstrapping with 5000 resamples to test the statistical significance of PLS-SEM results, including structural path coefficients, R^2 values, f^2 values and Heterotrait-Monotrait Ratio of Correlations (HTMT). The full results of structural model that included both the direct effect model, (baseline model), and moderating effect model are presented in Table 4. As shown in Table 4, the first hypotheses was supported, as TQM implementation was significantly associated with SME performance in hypothesized direction ($\beta = 0.11$, $t = 2.63$, $p < 0.01$). The second Hypotheses examined the effect of competitive intensity as a moderator of the relationship between TQM implementation and SME performance procedural justice variables and fairness perceptions. Unexpectedly, Table 4 showed that this hypothesis was not supported for TQM implementation to interact with competitive intensity in predicting SME performance ($\beta = -0.01$, $t = 0.18$, $p > 0.10$).

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Table 4: *Structural Model Results*

Hypotheses	Relations	Beta	SE	t-value	p-value	Findings
	Main Effect:					
H1	TQM	0.11	0.04	2.63***	0.00	Supported
	Moderating Effect:					
H2	TQM x CI	-0.01	0.05	0.18	0.43	Not supported

Note: TQM = Total Quality Management; CI = Competitive intensity; SMEP = SME performance; Note: ***Significant at 0.01 (1-tailed).

According to Cohen (1988), f^2 values of 0.02, 0.15 and 0.35 should be operationalized and interpreted as small, medium, and large effect sizes, respectively. The strength of the effect of exogenous latent variables on endogenous latent variable in the main effect PLS path model is reported in Table 5. As shown in Table 5, the strength of the effect of the four exogenous latent variables, namely: total quality management, and competitive intensity on endogenous latent variable were 0.011, 0.040, and 0.605, respectively. Accordingly, based on Cohen's (1988) guidelines, the effects sizes of these four exogenous latent variables on SME performance can be described and interpreted as none and large, respectively.

Table 5: *Effect sizes, coefficient of determination and construct cross-validated redundancy*

Endogenous Latent Variables	Effect size (f^2)	R^2	Q^2
Total quality management	0.011		
Competitive intensity	0.605	0.635	0.427

Note: Endogenous Latent Variable = SME Performance

Regarding the coefficient of determination, while some researchers (e.g., Hair, Hult, *et al.*, 2017), stressed that an acceptable R^2 values largely depends on the research context, Falk and Miller (1992) maintained that the minimum acceptable value should be 0.10 or 10%. Table 5 presents the variance in endogenous construct. As

shown in Table 5, our research model accounted for 63.5% of the variance in SME performance, which satisfactory level value of R-squared (Falk & Miller, 1992). Finally, Table 5 further showed that our model has predictive relevance following Chin's (1998) criterion (Hair, Hult, *et al.*, 2017).

V. Discussion

In this study, we were able to replicate and confirm the earlier research demonstrating that the performance of SMEs is significantly influenced by TQM implementation (e.g., Jyoti *et al.*, 2017; Parvadavardini *et al.*, 2016; Shafiq *et al.*, 2017; Singh & Maddulety, 2017). Most importantly, we proposed and tested hypothesis showing that the influence of TQM implementation on SME performance depends largely on competitive intensity. Such that influence of TQM implementation on SME performance becomes stronger for high competitive intensity and weaker for low competitive intensity (Anderson *et al.*, 1995; Kumar *et al.*, 2011; Wang *et al.*, 2012). However, this postulation was not statistically supported. One plausible reason for this non-significant moderating effect is that Nigerian business environment is not competitive (Agabi & Ojeyemi, 2014). This suggests that when "competitive intensity is low, managers may not feel the necessity to aggressively" to implement TQM (Lahiri, 2013, p. 304). Additionally, because Nigerian business environment is not competitive, owners and managers feel comfortable by continuing with the implementation of basic quality management programmes and engaging more on integrating, building, and reconfiguring their capabilities to adapt to changes in a business environment (Teece, Pisano & Shuen, 1997).

A. *Practical Implications*

The results from the present study revealed that implementation of TQM affords SMEs the leverage to achieve superior performance. This implies that promote customer satisfaction and achieve superior performance for their firms, owners and managers of SMEs ought to work hand in hand with all strategic business units, particularly quality assurance and marketing departments in designing relevant policies that help in promoting customer satisfaction and achieving sustainable superior performance (Lai, 2003; Lai & Cheng, 2005). To effectively achieve this, owners and managers of SMEs need to nurture employees to be actively involved in the implementation of TQM by improving their formal reward and recognition systems as well as providing them with necessary support and feedback (Demirbag *et al.*, 2006). To satisfy customer expectations and improve performance in the face of rapidly changing business environment, owners and managers of SMEs ought to develop an appropriate organization culture, vision, and quality policy (Demirbag *et al.*, 2006). Furthermore, owners and managers of SMEs need to carefully analyze the environment in which their firms operate so that can counter competition and achieve sustainable superior performance (Lahiri, 2013).

A. *Limitations and directions for further research*

The first limitation relates to the use of subjective measure of SME performance in the present study. Although subjective measures of firm performance are widely used by researchers and generally treated as a surrogate to objective measures, (Wall *et al.*, 2004), however, objective measures is relatively free from measurement error as well as high in validity and reliability (Devaraj, Hollingworth & Schroeder, 2001; Meier & O'Toole, 2012). Given the methodological limitation of subjective measures, future research could benefit from research replication by utilizing objective measures of SME performance to validate the findings of the present study. The second limitation of this study relate to the limited generalizability of results. The SMEs included in the present study were drawn mainly from a single manufacturing sector in Nigeria. Hence, the extent to which our findings can be generalized to other sectors is quite limited, which suggests examining other sectors including agriculture and services sectors in future research.

Our theoretically developed model incorporated mainly competitive intensity as a moderator of the relationship between TQM implementation and SME performance. This represents the third limitation of this study because competitive intensity is one of the several dimensions of external environmental factors of business. Therefore, future researchers may develop and test a multiple moderation model by incorporating other external environmental factors, such market turbulence and technological turbulence to deeply benefit from understanding of the boundary conditions between TQM implementation and SME performance.

In conclusion, the present study adds new knowledge in relation to the impact of total quality management, on SME performance in the Nigerian setting. A point of particular importance is that the present study has provided additional empirical evidence in the domain of resource-based view (Barney, 1991, 2000) and theory of quality management (Anderson *et al.*, 1995) by moving beyond the direct effect of total quality management on SME performance by incorporating competitive intensity as a moderator on this relationship. The findings will aid both practitioners and managers to take action towards enhancing firms' sustainable competitive

advantage by implementing value-creating strategies, including focusing on customer satisfaction, employees' quality of worklife, developing and implementation of new innovative ideas, Responding to a highly competitive market in which competitors adopts an aggressive program to keep the costs of theirs product very low is also an important strategic option to achieve and/or maintain a sustainable competitive advantage.

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