Improvement of Firm Performance, Competitiveness, and Quality Culture Through SCM Practices and TQM Practices at Manufacturing Industry in South Sulawesi, Indonesia

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ABSTRACT

The purpose of this study was aimed to examine the effect of SCM practices and TQM practices on quality culture, competitiveness and firm performance. To examine the effect of competitiveness on firm performance. In addition, to examine the indirect effects of SCM practices and TQM practices on firm performance through the mediation of competitiveness variables on manufacturing industries in South Sulawesi. The number of population was 384 companies. Data were collected through a survey of 105 manufacturing companies in Makassar, Gowa, and Maros district as research samples. The method of analysis used in this study was Descriptive Analysis and Analysis of Structural Equation Modeling (SEM). The results show that SCM practices have no significant effect on quality culture. TQM practices have a significant effect on quality culture. Both SCM practices and TQM practices have a significant effect on competitiveness. Then, SCM practices and TQM practices have a significant effect on firm performance. Both SCM practices and TQM practices indirectly have a positive impact on firm performance through the mediation of competitiveness variables. Competitiveness is more influenced by TQM practices than SCM practices. In contrast, firm performance is more influenced by SCM practices than TQM practices.

Keywords: Supply Chain Management Practices, Total Quality Management Practices, Quality Culture, Competitiveness, Firm Performance.

1. INTRODUCTION

The SCM practices and TQM practices are two of the most popular concepts, strategies and best practices in operational management that have been adopted by many manufacturing companies in the world.

Implementing TQM practices effectively can improve competitiveness and firm performance (Munizu *et. al.*, 2012). Effective collaboration in the supply chain system can increase the value of the company (Zhou and Benton, 2007). Competitiveness and firm performance can be improved through continuous improvement of overall business activities. The focus is to meet the customers needs. Continuous improvement activities are carried out throughout an organization that emphasizes on competitiveness and performance components of the organization (Heizer and Render, 2010; Krajewski *et. al.*, 2011).

Total Quality Management (TQM) besides as the philosophy and principles of management, is also a set of strategies and practices that can be used to improve the competitiveness and company performance through the fulfillment of customer needs and satisfaction (Sila, 2007). Supply Chain Management (SCM) practices have an impact on increasing the competitive product as well as on supply chain system (Chopra and Meindl, 2007). In addition, TQM and SCM practices expected to affect on organization culture, competitiveness and firm performance. Quality culture as part of the organizational culture is able to support both competitiveness and organizational performance in the long-term (Jabnoun and Sedrani, 2005; Rosana, 2009).

Empirical studies that examine the effects of SCM practice, and TQM practice on quality culture, competitiveness, and firm performance partially have been found in the management literature. Some research results conclude that both TQM practices and SCM practices as best practice approach in corporate strategy affect the quality culture, competitiveness, and company performance (Sila, 2007; Wirawan, 2007; Prayogo and Hong, 2008; Salehaldin, 2009, Miyagawa and Yosida, 2010, Munizu et. al., 2012). However, testing relations model among SCM practice, TQM practice, quality culture, competitiveness and company performance is still rarely done in previous research.

Therefore, the purpose of this study is to investigate: (1) the effect of supply chain management practices on quality culture; (2) the effect of total quality management practices on quality culture; (3) the effect of supply chain management practices on competitiveness; (4) the effect of total quality management practices on competitiveness; (5) the effect of supply chain management practices on firm performance; (6) the effect of total quality management practices on firm performance; (7) the effect of competitiveness on firm performance; (8) the effect of supply chain management practices on firm performance through competitiveness mediation; and (9) the effect of total quality management practices on firm performance through competitiveness mediation

2. LITERATURE REVIEW

Chopra and Meindl (2007) assert that supply chain involves all parts, either directly or indirectly, to meet consumer demand. The supply chain is not only concerned with manufacturing and suppliers, but also involves transportation, warehouses, retailers, and customers themselves. According to Heizer and Render (2010), Supply Chain Management related to management activities started to obtain raw materials to be products in a process/intermediate product, and finished goods at the end. Then, sending the overall products to customers through the distribution/logistics system. Pujawan and Erawan (2010) stated that supply chain management is an extension of logistics management. Logistics management activities include companies, suppliers, and customers. While the scope of supply chain management is broader than logistics management, i.e.: between suppliers, own companies, customers, wholesalers and retailers that are integrated to be more efficient.

Total Quality Management is an approach to improve the quality systematically by using many dimensions. TQM philosophy is using a holistic approach that seeks to integrate all organizational functions to focus on meeting customer needs and organizational goals, for example in enhancing competitiveness and organizational performance (Prayogo and Hong, 2008; Salehaldin, 2009; Miyagawa and Yosida, 2010 Munizu et. al., 2012).

Quality culture is a subset of organizational culture. Organizational culture is built on three levels: (1) the first level is the concrete manifestation of activities and events as the result of thinking including artefacts and creation, (2) the second level is values and beliefs, and (3) the third level is the basic assumption (Schein, 2004; Kujala and Lillrank, 2004). The basic assumption can be used as a tool to assess the quality culture of an organization. The basic assumptions can be measured by the vision of the organization and its relation to the environment, the nature of human activity, the nature of reality and truth, and the nature of space and time.

Competitiveness is related to the widespread firms' capability in creating a defensive position compared its competitors. Price/cost, quality, delivery, and flexibility as competitiveness elements (Krajewski et. al., 2011). Firm's performance will increase when the company becomes stronger it's competitiveness through improvements in four dimensions i.e.: quality, cost, delivery and flexibility (Han et. al., 2007).

According to Li et. al., (2006), the company's performance refers to how well an organization achieves its marketing and financial goals. Thus, the company's performance is measured in two performance measures namely marketing performance, and financial performance. Company performance can also be measured using marketing and financial measures, such as ROI (return on investment), market share, profit margins from sales, ROI growth, sales growth, market share growth, and return on assets (ROA) (Li et. al., 2006; Han et. al., 2007; Lakhal, 2009; Salaheldin, 2009, and Munizu et. al., 2012). Based on the results of the review of relevant literature and also previous research, the conceptual framework of this study can be presented in the following figure.
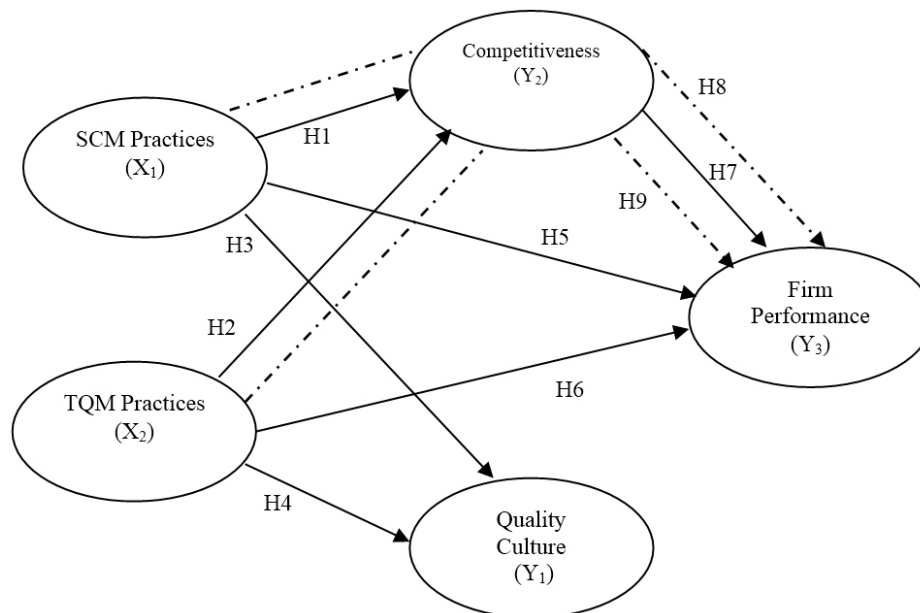

Figure 1: Conceptual Framework Model

Based on the results of the literature study and conceptual framework above, the research hypothesis can be formulated as follows:

1. Supply chain management practices affect quality culture (H1)

2. Total quality management practices affect quality culture (H2)

3. Supply chain management practices affect competitiveness (H3)

4. Total quality management practices affect competitiveness (H4)

5. Supply chain management practices affect firm performance (H5)

6. Total quality management practices affect firm performance (H6)

7. Competitiveness affects company's performance (H7)

8. Supply chain management practices affect firm performance through competitiveness (H8)

9. Total quality management practices affect firm performance through competitiveness (H9)

3. RESEARCH METHODS

This study used a quantitative approach, that is an approach which emphasizes the testing of theories or concepts through measurement of variables and performs data analysis procedures with statistical tools. Generally, this approach aimed to test the hypothesis and research model (Sugiyono, 2012). The number of population of this research was 384 units of medium and large-scale manufacturing companies (BPS South Sulawesi, 2016). This research was conducted in Makassar City, Gowa Regency, and Maros Regency. The sample size was 105 units of the company which determined by using Slovin formula at $\alpha = 10\%$. Sampling technique using simple random sampling. The variables tested in this study consisting of five variables, namely: (1) Supply Chain Management Practices, (2) Total Quality Management Practices, (3) Quality Culture, (4) Competitiveness, and (5) firm performance.

Supply Chain Management Practices (X_1) was referring to Li et. al., (2006), Li and Lin (2006), using 5 indicators i.e.: Management strategic partnership ($X_{1.1}$), Cross-functional collaboration ($X_{1.2}$), Customer relationship ($X_{1.3}$), Information sharing ($X_{1.4}$), and postponement ($X_{1.5}$). Total Quality Management Practices (X_2) was referring to Han *et. al.*, (2007), Prayogo and Hong (2008), Miyagawa and Yoshida (2010), using 8 indicators i.e.: The role of top management ($X_{2.1}$), Quality data reporting ($X_{2.2}$), Employee Relations ($X_{2.3}$), Supplier Quality Management ($X_{2.4}$), Training ($X_{2.5}$), Quality Policy ($X_{2.6}$) Process management ($X_{2.7}$), and Product design ($X_{2.8}$). Quality culture (Y_1) was referring to Kujala and Lillrank (2004), using 4 indicators i.e.: Mission of the organization and its relation to environment ($Y_{1.1}$), the nature of reality and truth ($Y_{1.2}$), Human nature and its interaction ($Y_{1.3}$), and the nature of time and space ($Y_{1.4}$). Competitiveness (Y_2) was referring to Han *et. al.*, (2007); Lakhal (2009), using 6 indicators i.e.: Cost ($Y_{2.1}$), Quality ($Y_{2.2}$), Flexibility ($Y_{2.3}$), Speed of delivery ($Y_{2.4}$), Product innovation ($Y_{2.5}$), and Market response rate ($Y_{2.6}$). Then, firm performance (Y_3) was referring to Han *et. al.*, (2007), and Munizu *et. al.*, (2012), using 4 indicators i.e.: Market share growth ($Y_{3.1}$), Sales growth ($Y_{3.2}$), ROI (Return on Investment) ($Y_{3.3}$), and Labor productivity ($Y_{3.4}$).

Testing of validity and reliability of the instrument was performed on 30 units of the company. The result of instrument test shows that the questionnaire used has high validity and reliability, so it can be used for data collection of research. Validity test is done through item analysis by Pearson Product Moment

Correlation method. An indicator/item is said to be valid if it has a value of $r > 0.30$. Meanwhile, reliability test using Alpha Cronbach coefficient (α). An instrument can be said reliable if the value of α is greater than 0.60 (Hair et. al., 2006; Sugiyono, 2012). The analysis method used is Descriptive Analysis and Structural Equation Modeling Analysis. Data is processed using IBM AMOS 23 software.

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis Results

Based on the results of the descriptive analysis that presented in the table, it can be seen that respondents of this study consisted of men 88 people (83.81%), and women 17 people (16.19%). In terms of age, respondents who have under the age of 30 years as many as 12 people (11.43%), 30-40 years as many as 25 people (23.81%), 41-50 years as many as 50 people (47.62%), and over 50 years as many as 18 people (17.14%).

Table 1
Description of Respondent's Characteristics

S.No.		Description	Frequency (person)	Percentage (%)
1.	Sex	(a) Male	88	83.81
		(b) Female	17	16.19
2.	Age	(a) Under 30 years	12	11.43
		(b) 30 - 40 years	25	23.81
		(c) 41 - 50 years	50	47.62
		(d) Over 50 years	18	17.14
3.	Education level	(a) Senior high school	11	10.48
		(b) Diploma	20	19.05
		(c) Bachelor (S1)	66	62.86
		(d) Post graduate (S2/S3)	8	7.62
4.	Working period	(a) Under 5 years	2	1.90
		(b) 5 - 10 years	54	51.43
		(c) 11 - 15 years	22	20.95
		(d) 16 - 20 years	15	14.29
		(e) Over 20 years	12	11.43
5.	Position	(a) Operation manager	55	52.38
		(b) HRM manager	20	19.05
		(c) Marketing manager	12	11.43
		(d) Supervisor	18	17.14
	Total		105	100.00

Source: Processed data (2017).

In general, respondents in this study predominantly age between 30-50 years (71.43%). The age of this group theoretically was a productive age. Then, based on the level of education dominantly was a bachelor (S1) as many as 66 people (62.86%). Furthermore, based on working period, it can be known that dominant respondents have a working period of 5-10 years, i.e. 54 people (51.43%). In addition, the

dominant respondent has a position as operations manager as many as 55 people (52.38%), while the rest are respondents who served as HR manager, marketing manager, and supervisor within the company.

4.2. Hypothesis Testing

4.2.1. Confirmatory Factor Analysis (CFA)

The result of confirmatory factor analysis on each research variables can be presented completely in the following table.

Table 2
Result of Confirmatory Factor Analysis (CFA)

Variables	Indicators	Loading Factor	Goodness of Fit Indices (GFI)	Description
Supply Chain Management Practices (X_1)	$X_{1.1}$	0.474	0.968	Significant/Fit
	$X_{1.2}$	0.677		Significant/Fit
	$X_{1.3}$	0.853		Significant/Fit
	$X_{1.4}$	0.723		Significant/Fit
	$X_{1.5}$	0.572		Significant/Fit
Total Quality Management Practices (X_2)	$X_{2.1}$	0.399	0.948	Significant/Fit
	$X_{2.2}$	0.450		Significant/Fit
	$X_{2.3}$	0.548		Significant/Fit
	$X_{2.4}$	0.423		Significant/Fit
	$X_{2.5}$	0.431		Significant/Fit
	$X_{2.6}$	0.913		Significant/Fit
	$X_{2.7}$	0.915		Significant/Fit
	$X_{2.8}$	0.680		Significant/Fit
Quality Culture (Y_1)	$Y_{1.1}$	0.340	0.995	Significant/Fit
	$Y_{1.2}$	0.358		Significant/Fit
	$Y_{1.3}$	0.782		Significant/Fit
	$Y_{1.4}$	0.827		Significant/Fit
Competitiveness (Y_2)	$Y_{2.1}$	0.632	0.967	Significant/Fit
	$Y_{2.2}$	0.803		Significant/Fit
	$Y_{2.3}$	0.832		Significant/Fit
	$Y_{2.4}$	0.844		Significant/Fit
	$Y_{2.5}$	0.910		Significant/Fit
	$Y_{2.6}$	0.641		Significant/Fit
Firm Performance (Y_3)	$Y_{3.1}$	0.653	0.987	Significant/Fit
	$Y_{3.2}$	0.743		Significant/Fit
	$Y_{3.3}$	0.719		Significant/Fit
	$Y_{3.4}$	0.317		Significant/Fit

Source: Processed data (2017)

Based on the results presented in the table above, it can be seen that variable of supply chain management practices (X_1) is more dominant formed by indicator $X_{1.3}$ with a loading factor of 0.853. Variable of total quality management practices (X_2) more dominant formed by indicator $X_{2.7}$ with a loading factor of 0.915. Quality Cultural (Y_1) is more dominant formed by indicator $Y_{1.4}$ with the loading factor of 0.827. Then, variable of competitiveness (Y_2) is more dominant formed by indicator $Y_{2.5}$ with a loading

factor of 0.910. Finally, variable of firm's performance (Y_3) more dominant formed by indicator $Y_{3.2}$ with loading factor equal to 0.743.

4.2.2. Structural Equation Modeling Analysis

The structural equation model (SEM) analysis begins with a test of the suitability level of the structural equation model based on the cut-off values as used in the confirmatory factor analysis (CFA). The result of testing of suitability level of structural model of causality relation between SCM practice, and TQM practice on quality culture, competitiveness and business performance was presented in the following table.

Table 3
Results of Goodness of fit indices Overall Model Test

Criterium	Cut-off Value Standard	Result	Model evaluation
Chi-Square	Expected small	110.770	Good
CMIN/DF	≤ 2.00	1.055	Good
GFI	≥ 0.90	0.942	Good
RMSEA	≤ 0.08	0.028	Good
CFI	≥ 0.95	0.979	Good
TLI	≥ 0.95	0.958	Good

Source: Processed data (2017).

The table above shows the results of the final structural model testing, where the test results meet the 6 standard criteria. Therefore, the research model has met the requirements of a fit model. Thus, the model is acceptable and no need required for modification (Hair *et. al.*, 2006). Furthermore, the research model is used to estimate and analyze the results of research based on empirical data. The result of the structural model was presented in Figure 2 below.
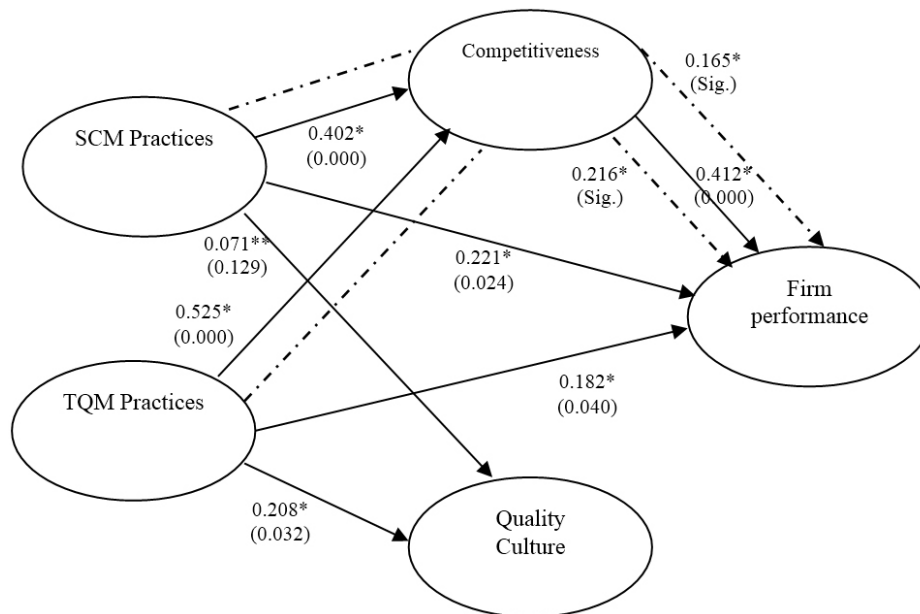

Figure 2: Result of Structural Model Testing The Effect of X1, X2, toward Y1, Y2, and Y3

Based on the Figure 2 above, it can be presented the results of hypothesis testing as seen in the following table.

Table 4
Results of Hypothesis Testing

Exogenous Variables	Endogen Variables	Mediation Variables	Loading Factor (Standardized)	Problem	Description
			Direct Effect		
SCM Practices	Quality Culture	–	0.071	0.129[**]	No significant (H1, rejected)
TQM Practices	Quality Culture	–	0.208	0.032[*]	Significant (H2, accepted)
SCM Practices	Competitiveness	–	0.402	0.000[*]	Significant (H3, accepted)
TQM Practices	Competitiveness	–	0.525	0.000[*]	Significant (H4, accepted)
SCM Practices	Firm performance	–	0.221	0.024[*]	Significant (H5, accepted)
TQM Practices	Firm performance	–	0.182	0.040[*]	Significant (H6, accepted)
Competitiveness	Firm performance	–	0.412	0.000[*]	Significant (H7, accepted)
			Indirect Effect		
SCM Practices	Firm performance	Competitiveness	0.322 x 0.412 = 0.165		Significant (H8, accepted)
TQM Practices	Firm performance	Competitiveness	0.525 x 0.412 = 0.216		Significant (H9, accepted)

Source: Processed data (2017).
Noted: [*]significant at $\alpha \leq 0,05$; [**]No significant at $\alpha \leq 0,05$.

Based on the results of hypothesis testing in the above table, it can be concluded that from 9 hypotheses tested in this study, 1 hypothesis rejected, and 8 hypotheses accepted or in other words supported by empirical facts.

The results showed that SCM practices have no significant effect on quality culture. Meanwhile, TQM practices have a significant effect on quality culture. These results indicate that implementation of TQM practices provides a greater role in shaping the company's quality culture than SCM practices. This result was in line with Munizu et. al., (2012) that effective TQM practice can accelerate the process of transforming organizational culture into a quality culture. The results of this study also support the results of previous research (Kujala and Lillrank, 2004) that the implementation of TQM can change organization culture orientation to became quality culture.

Furthermore, variable of SCM practices and TQM practices have a significant effect on corporate competitiveness. However, TQM practices give more contribution in improving competitiveness compared to SCM practices. Effective TQM practices can produce high competitiveness on manufacturing industry. Properly formulated quality policy brings benefits to the enhancement of firm's competitiveness, primarily

related to the company's fast-paced, timely activities in delivering products to consumers, and the company always consistent in providing the quality product to customers (Prayogo and Hong, 2008). The collaboration was built through effective supply chain systems can drive the company competitiveness (Li et. al., 2006; Li and Lin, 2006; Zhou and Benton, 2007; Mamad and Chahdi, 2013). Then, the results of this study support of studies conducted Sila (2007), Han et. al., (2007) and Munizu *et. al.*, (2012) that TQM practices have a positive effect on competitiveness.

SCM practices and TQM practices have a significant effect on firm's performance. However, SCM practices contribute significantly to improving company performance compared to TQM practices. These results are in line with Mamad and Chahdi (2013) and Wu et. al., (2014) that effective collaboration in the supply chain system will increase the value of the company. TQM practices have a positive impact on company performance (Demirbag et. al., 2006, Prajogo and Hong, 2008; Miyagawa and Yoshida, 2010; Munizu et. al., 2012).

Both supply chain management practices and total quality management practices indirectly have a positive effect on company's performance through the mediation of competitiveness variables. The results of this study in line with Li et. al., (2006), Han et. al., (2007) and Lakhal (2009) that company's performance can be increased as the company becomes stronger its competitiveness. Krajewski et. al., (2011) said that TQM practices are philosophy, concept, and strategy was equipped with a set of tools to improve both competitiveness and firm's performance. Furthermore, Chopra and Meindl (2007) said that the purpose of a supply chain system is to maximize the overall value of the company. The overall value of the supply chain is related to supply chain efforts to meet customer need as well as demand.

5. CONCLUSIONS AND RECOMMENDATIONS

SCM practices have no significant effect on quality culture, while TQM practices have a significant effect on quality culture. Both SCM practices and TQM practices have a significant effect on competitiveness. In addition, both SCM practices and TQM practices also have a significant effect on firm performance. Then, SCM practices and TQM practices indirectly have a positive effect on firms performance through the mediation of competitiveness variables. Competitiveness is more influenced by TQM practices than SCM practices. In contrast, firm's performance is more influenced by SCM practices than TQM practices. The results of this study provide some implications for managers in the organization. Management should be consistent in improving both elements of supply chain management practices, and quality management practices. So that, the concept of quality culture could be internalized within the organization, also produce higher competitiveness as well as firm performance. Furthermore, management effort to improve the elements of competitiveness is a key focus in the context of implementing supply chain management practices and total quality management practices to create better firm performance, especially at manufacturing industry.

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