Development of integration model of supply chain management and total quality management on company performance with competitive advantage as intervening variable

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Abstract. This research aims to find out whether the integration with supply chain management and total quality management will provide a significant influence on company performance. The approach of supply chain management with four dimensions, namely: Strategic supplier partnership, customer relationship, Quality Information sharing, and level information sharing. Variable of total quality management is measured from Top Management, Customer focus, and continue Improvement. Variable of competitive advantage consists of two dimensions, which are Intangible Asset and Asset Tangible. As for variable of company performance measured by three indicators, financial performance, operational performance and performance-based marketplace. Data collection is gathered by distributing questionnaires. The Analysis method used in hypothesis is Structural Equation Modeling (SEM) by using Partial Least Square (PLS). The research found that the integration of Supply Chain management and Total Quality Management have significant effect on the performance of the company.

1. Introduction

The challenges facing the industry today demand continuous improvement on company performance in order to survive and win the business competition. Modern business competition brings impacts on changing the focus of competition from competition among company independently to competition between networks such as supply chains. Global market competition has a significant influence on business activities, both local and international. [1]

One of the keys to the success of global business competition is supply chain management, [2]. This statement is also supported by Gonzales at al [3] research, which states that: "supply chain Management is a very fundamental principle that needs to be applied by the company in the business processes related to corporate profits and cooperation ".

Previous author states that many companies can achieve their competitive advantage by applying Supply Chain Management, and to achieve competitive advantage, the supply chain should be managed appropriately [4]. In addition to supply chain management concepts that can increase competitive advantage and corporate performance, there are other studies presented by Thaleb, [5] and BaofangHuo [6] which stated that Quality management is the key to improving company performance. Several empirical studies have been conducted in several developing countries and researchers and practitioners have concluded that there is a positive effect between quality management and performance of company [7].
Competitive advantage is a form of strategy to assist companies in maintaining its sustainability. Sustainable competitive advantage is the company's strategy to reach the ultimate goal, which is performance that generates maximum advantage. This means that sustainable competitive advantage is not the end goal, but a means to achieve the end goal of the company i.e. increase the performance of the company [8]. The company's performance is the result of actual or output generated by a company measured and compared to the expected results or output. So companies are able to compete and have good performance of the company, then it can be supported by implementing Total Quality management and supply chain management [9]. Total Quality management focus on how the effort to increase customer satisfaction, while supply chain management is trying to improve performance by integrating the function the internal of an organization associated with the external operations: suppliers, customers, and members in the supply chain [10,11]. Stated that a variety of integration between variables that are so complex aims to improve the performance, will be something special as a management tool for decision making.

2. Problems background
Based on the introduction above, the problems that want to be analyzed in this research are:

2.1. How to develop a theoretical model for supply chain management to improve the performance of the company.
2.2. How the effect of supply chain management on competitive advantage and performance of company.
2.3. How the effect of Total Quality Management on competitive advantage and performance of company.
2.4. Does competitive advantage improve the performance of the company?

3. Research objectives
3.1. Develop a model of supply chain management to improve company performance.
3.2. Test and analyze the performance of supply chain management and total quality management towards a competitive advantage.
3.3. Analyze the effect of competitive advantage to the company's performance.

4. Literature review
4.1. Supply chain management
The term of supply chain management was originally a process of relationship activity between purchases and logistics, [13]. The function of logistics and he purchases is a critical part in the supply chain management concept. However, in the Agan, yazuz [14] study, the term supply chain management experienced meaning that expansion of supply chain management is becoming a very important in the development of a competitive advantage, and also is a core competence. Supply chain management is an approach used to achieve more efficient integration of organizations from suppliers, manufacturers, distributors, retailers and customers. [15]. This means that the goods are produced in exact quantity at the right time and at the right place with the goal of achieving the minimum cost and obtain the expected level of services.
4.2. **Total quality management**
Deming [19] used 14 steps to determine the quality improvement and were developed into 5 effective concept presented by Heizer and Render
1. Continuous improvements
2. Employee Empowerment
3. Performance Comparison
4. Providers need timely
5. Knowledge of Total Quality Management.

4.3. **The theory of competitive advantage**
One that is applied in a competitive advantage is to by identifying the assets of the company, Tangible and Intangible. According to Marcia [16], argued that the ownership of intangible assets would provide Tangible benefits (profitability). The Figure 1 show the organization's resources.

![Organizational Wealth](image1)

**Figure 1.** Organizational resources

4.4 **Company performance theory**
Experts reveal that the most commonly used measures of company performance in empirical research are financial performance, operational performance (performance performance), and market-based performance.

5. **Research methods**
This study will examine the effect of SC and TQM on competitive advantage and performance of the company. Partial Least Square analysis is used to test the hypothesis.
The following is the operational definition of each variable:

1. SCM is an approach used to achieve the integration of various companies /or work units with the spirit of collaboration and coordination that consist of suppliers, manufacturers, distributors, retailers, and customers.
2. TQM is an approach in obtaining and maintaining high quality output, focusing on maintenance, service and customer satisfaction.
3. Competitive advantage is the company's ability to create value that is not owned and cannot be imitated by competitors.
4. Company performance is a level of company achievement in optimizing the goal that has been set and can be valued by comparing the achievement criteria from some companies in similar industry.
5. The respondents of this research are company members covering general manager, head unit / section, owner and board of directors and administrative staff who work in plantation companies.
both state-owned and private, with experience of at least 1 year. Of the 250 questionnaires distributed, only 185 questionnaires were used while there were 43 non-return questionnaires and 22 incomplete questionnaires. The description of the questionnaire used can be seen in table 1.

Table 1. Details of the questionnaire

| Questionnaire                                   | The total number of |
|------------------------------------------------|---------------------|
| Questionnaire distributed                      | 250                 |
| Questionnaire used for data input              | 185                 |
| unreturned questionnaire                       | 43                  |
| Incomplete questionnaire                       | 22                  |

Table 1 informs that the response rate reached 82.8% which 74% of them were used in this research. The hypothesis in this research will be tested by using Partial Least Square Analysis (PLS). PLS analysis has two models, outer model and inner model. Outer model shows the specification of the relationship between variables and the indicator. While innermodel (inner relation / structural model) shows specification of relationship between latent variable, which is between exogenous / independent variable and endogenous / dependent variable.

6. Results and discussion

Based on PLS results, it is found that all the empirical indicators used have met the test of the outer model that includes convergent validity (loading factor), discriminant validity, and composite reliability.

Table 2. Result of loading factor

| Variable | Original sample(O) | T- Statistics |
|----------|--------------------|---------------|
| SCM      |                    |               |
| X1       | 0.736              | 14.373        |
| X2       | 0.783              | 20.111        |
| X3       | 0.833              | 17.201        |
| X4       | 0.825              | 22.076        |
| X5       | 0.710              | 11.869        |
| X6       | 0.800              | 17.271        |
| X7       | 0.616              | 7.890         |
| TQM      |                    |               |
| X8       | 0.639              | 9.418         |
| X9       | 0.871              | 25.443        |
| X10      | 0.670              | 14.304        |
| X11      | 0.662              | 12.206        |
| X12      | 0.661              | 18.884        |
| X13      | 0.811              | 16.271        |
C. ADVANTAGE

| Y1  | 0.682 | 10,034 |
|-----|-------|--------|
| Y2  | 0.821 | 23,125 |
| Y3  | 0.705 | 11,630 |
| Y4  | 0.812 | 22,075 |
| Y5  | 0.638 | 10,456 |
| Y6  | 0.679 |  8,699 |
| Y7  | 0.822 | 17,271 |
| Y8  | 0.811 | 22,074 |
| Y9  | 0.794 | 13,932 |
| Y10 | 0.692 | 11,058 |

COMPANY PERFORMANCE

| Y11 | 0.601 | 8,334 |
|-----|-------|--------|
| Y12 | 0.749 | 10,530 |
| Y13 | 0.731 | 11,895 |
| Y14 | 0.766 | 18,325 |
| Y15 | 0.615 |  8,945 |
| Y16 | 0.899 | 25,531 |

Result of convergent validity test can be seen on table 1 above, where every empirical indicator has loading factor score > 0.6 and t-statistic > 1.96.

6.1. Discriminant validity

Discriminant validity is needed to ensure that each concept of each latent variable is different from other variables. The model has a good discriminant if the loading factor of each indicator has the greatest value compare to other latent variables. Discriminant validity test results are obtained as follow:

|       | SCM  | TQM  | CA   | CP   |
|-------|------|------|------|------|
| X1    | 0.671| 0.324| 0.425| 0.355|
| X2    | 0.604| 0.432| 0.265| 0.469|
| X3    | 0.621| 0.292| 0.267| 0.326|
| X4    | 0.766| 0.378| 0.486| 0.428|
| X5    | 0.702| 0.499| 0.196| 0.276|
| X6    | 0.582| 0.451| 0.415|  0.18|
| X7    | 0.590| 0.25 | 0.510|  0.310|
| X8    | 0.442| 0.607| 0.346|  0.481|
| X9    | 0.198| 0.518| 0.501|  0.306|
| X10   | 0.413| 0.592| 0.336|  0.292|
| X11   | 0.364| 0.603| 0.246|  0.363|
| X12   | 0.265| 0.553| 0.183|  0.378|
| X13   | 0.428| 0.613| 0.321|  0.218|
| Y1    | 0.212| 0.304| 0.501|  0.442|
| Y2    | 0.393| 0.232| 0.543|  0.306|
| Y3    | 0.485| 0.358| 0.613|  0.380|
| Y4    | 0.304| 0.395| 0.509|  0.242|
| Y5    | 0.242| 0.428| 0.607|  0.325|
From the table above, it shows that every indicator has the greatest value of the loading indicator in the variable which it is formed. It can be concluded that all the empirical indicators have met the discriminant validity criteria.

6.2. Composite reliability

| Composite Reliability | Average Variance Extracted |
|-----------------------|-----------------------------|
| SCM                   | 0.866                       |
| TQM                   | 0.922                       |
| CA                    | 0.943                       |
| PC                    | 0.881                       |

Based on table 3 above, all the construct have met the reliability criteria. It is shown by composite reliability score that above 7 and AVE above 0.5

6.3. Result for Inner weight

Following is the estimation of path coefficient

1. The effect of SCM (X1) on competitive advantage (Y1) and company performance (Y2).

   The effect of SCM on the t-stat’s competitive advantage value is 5.263 here t Statistics> t- table with influence of SCM on company performance coefficient is 0.314 with t-statistic 0.411. The SCM variable contributes 0.543 to the competitive advantage (Y1), means that if SCM (X1) increases by one unit, then the competitive advantage variable (Y1) will increase by 0.543. The SCM (X1) variable has an effect at 0.314. Therefore, the effect of total SCM variable on company performance (Y2) is: 0.543 + 0.314 x 0.455 = 0.389 = 38.9%.

2. The effect of TQM against competitive advantage (Y1) and company performance (Y2)
The effect of TQM against competitive advantage with statistic T-statistic is 2.150, where \( t \)-stat > \( t \)-table 2.210 > 1.96. Therefore, the effect of TQM against the CA is significant with path coefficient 0.295 whereas the effect of TQM against CP is significant due to \( t \)-stat 2.320 > 1.96. TQM variables give contribution effect as 0.295 towards CA (Y1), means if variable TQM (X1) increase one unit the performance also increase 0.415 towards company performance (Y2). Hence, the effect of total variable TQM (X2) against company performance are: 0.295 + 0.415 x 0.455 = 0.323 or 32.3%.

3. The effect of Competitive advantage (CA) as the intervening variable against company performance (Y2)
   The effect of CA against CP is 3.523 where \( t \)-statistic > \( t \)-table where 3.523 >1.96. So the effect of competitive advantage against the company performance is significant at 0.455. This means CA as variable intervening against the company performance give significant impact.

7. Conclusions
1. Supply chain management has significant effect on company performance. The good implementation of supply chain management can improve the performance of the company.
2. Total Quality Management has significant effect on company performance. The good implementation of total quality management will improve both financial and operational of the company performance.
3. The competitive advantage \( R^2 = 0.448 \) means that 44.8% competitive advantage variables are influenced by supply chain management factors and the remaining management quality is caused by other factors. While company performance \( R^2 = 0.591 \) means 59.1% variable of company performance influenced by competitive advantage as intervening variable, supply chain management and total quality management.

8. Suggestion
1. The role of management is crucial for the success of SCM and TQM in a company, so the company can conduct a continuous program on a regular basis with suppliers so that the quality and quality produced by the supplier does not decrease.
2. Future research is expected to expand this research by conducting research on manufacturing industries, services and various businesses both small and medium.
3. Further research looks for other variables that may also have a relationship with the implementation of TQM and SCM.

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