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Mediating Role of Strategic Supply Management On Performance

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Abstract

The environmental uncertainty of business plays an important role for the implementation of supply chain management. Sustainability of operation process is strongly influenced by the continuity supply of raw materials and parts, as well as the production process used. Indonesian pharmaceutical industry is one industry that is full of a lot of interest because it is directly related to the public health. Moreover, almost 90% of the raw materials of pharmaceutical industry in Indonesia are imported, which means the supply chain in this industry is also highly dependent on the stability of business environment. The study was conducted on 247 pharmaceutical companies in Indonesia to determine the effect of demand uncertainty, supply uncertainty, and technological uncertainty on strategic supply management and performance. The analysis showed that demand uncertainty is the only variable that does not affect the supply management strategic. Another finding is that there is influence of strategic supply management on the suppliers' performance and buyers' performance.

Keywords: business environmental uncertainty, pharmaceutical industry, performance, strategic supply management.

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1. Introduction

Indonesia is a developing country located in Southeast Asia with an area of 1,919,440 square kilometers. As an archipelago country, Indonesia has approximately 17,508 islands with a total population of over 238 million people. As a developing country with the geographical conditions of the islands, the distribution of goods and services are often become the main obstacle in the equitable distribution of goods and services, including medicines. Indonesia is a lower-middle income country, where a significant proportion of the population does not have access to affordable healthcare. Despite it having an above-regional average total pharmaceutical market size (US$6.04 billion in 2011), per capita expenditure on pharmaceuticals (US$25) is below the average for South East Asia. With 29 pharmaceutical multinationals operating in the country, with a total market share of 25%, there are significant revenue-earning opportunities for multinational drug makers. This is further substantiated by strong economic base, low production costs and increasing demands for drugs. Having said this, the prevalence of self-medication and generic drugs make for a challenging operating environment for innovative drug makers (BMI, 2013). Total sales of pharmaceutical products in Indonesia tend to increase starting at U.S. $ 2.79bn in 2008 to U.S. $ 6.25bn in 2012 and are estimated to continue to increase up to U.S. $ 9.72 in 2017 as shown in Figure 1 (BMI, 2009-2013).
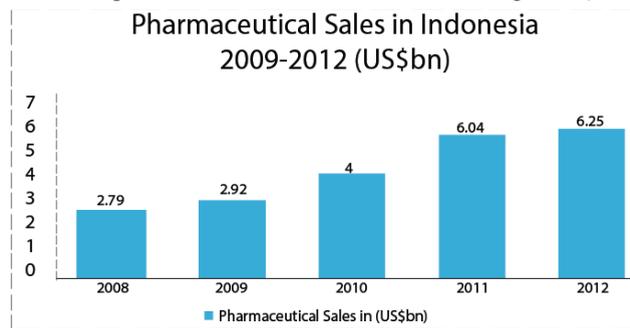

Figure 1. Pharmaceutical Sales in Indonesia 2008-2012.

The development of the pharmaceutical industry in Indonesia is not balanced by the ability of national companies producing raw materials in the country. Almost 90% of raw materials used in the Indonesian pharmaceutical industry are imported. This resulted in the instability of the supply chain of pharmaceutical products in Indonesia because import of raw materials is strongly affected by the world economic and political conditions. The role of supply chain management in this industry needs to be sought in order to make the distribution of medicines can be more effective. The role of government is also needed to improve the availability of cheap and quality medicines for the people.

From the manufacturer side, there are so many factors that affect the implementation of a good supply chain management. Environmental uncertainty, both internal and external is a challenge for companies to constantly improve the entire supply chain management practices. The impact of environmental uncertainty on supply chain is the focus of transaction on economic cost and resource dependence perspective (Paulraj and Chen, 2007). Environmental uncertainty, even in the simplest conditions, causing companies tend to perform vertical integration. On the other hand, resource dependence theory states if a company is experiencing environmental uncertainty, it will seek to balance his condition by strengthening inter-organizational ties. In the era of modern business, many companies are trying to focus only on their core competencies. Other competencies needed in the operation of the company can be obtained through outsourcing that makes vertical disintegration as a common practice (Paulraj and Chen, 2007). The environmental uncertainty is an interesting topic to be analyzed which can also be attributed to the ability of a company to make efforts in order to make improvements and prevention so it can still survive in the industry. Environmental uncertainty also affects the supply chain management, how management can anticipate rapid changes in the environment as well as to reduce costs. The successful implementation of supply chain management can also be measured by the performance of the parties involved in the supply chain, which includes suppliers and buyers.

Imperfect competition in the market, incomplete information acquisition, and dependence on the resources in supply chain operation environment lead to environmental uncertainty is one of the important factors affect the operation of supply chain efficiency (Decheng and Yu, 2013). The term uncertainty can be viewed as the lack of information about the medium surrounding the firm and is generated by the level of dynamism and complexity (Kreiser and Marino, 2002). Some existing research about environmental uncertainty mostly showed that environmental uncertainty had positive impact on firms. Krasnikov and Jayachandran (2008) studied about environmental uncertainty and firm's capabilities found out that environmental uncertainty and firm's capabilities play critical roles in firms. Furthermore, the research of Yanes-Estévez, et al (2010) showed that the main sources of environmental uncertainty are demand and competitors.

External and internal business environment is a key driver of supply chain management practices moving towards a better direction in order to meet customer demands on time and desired quality. The business environment is constantly changing and these changes will occur more quickly. Acceleration of these changes are caused by some important factors: (1) the increase of consumers' require of quality products at affordable prices; (2) the increase of infrastructure in information, transportation, and banking, enabling for the development of new models in the management of the flow of materials / products; (3) awareness of the importance of social and environmental aspects. Environmental uncertainties that could affect strategic supply management include demand uncertainty, supply uncertainty, and technological uncertainty (Paulraj and Chen, 2007). Under conditions of uncertainty, strategic supply management can facilitate the acquisition of major resource companies to achieve competitive advantage. The framework is also based on strategic management theory that emphasizes on the mutual advantage. Within this approach, the business world is an interdependent network through a strategic collaboration to achieve of the common goals of getting bigger economic benefits together (Dyer, 2000).

External uncertainties could reduce the company's ability to control the flow of resources and adaptability to decision making. Resource dependency theory states that firms that face external uncertainties would create negotiated environment and create inter-organizational relationships to respond against this environmental uncertainty. Uncertainty can arise from supply uncertainty, demand uncertainty, and technological uncertainty. Uncertainty of supply can be either timely performance, average delay, or the level of inconsistency. Uncertainty of demand can be forecast error, the diversity of products, and irregular orders. Technological uncertainties may include increased competition and technological innovation (Paulraj and Chen, 2001).

Strategic supply management is centered on the superior relationship among members of the supply chain to produce a win-win solution for both suppliers and buyers. However, it must be noted that this strategic relationship is not always the best alternative in each case. Contingency approach of supply chain management believes that high profits will be obtained if the products are produced using high collaboration. This study focuses on the close relationship between the supplier and the buyer. The connection between suppliers and buyers is critical in the strategic management of the supply side. In order to become a strategic supply management in its operations, the companies as buyers need to adopt a strategic initiative in order to obtain a superior relationship to achieve advantage. Some studies in the field of strategic supply management focuses on the relationship between supplier and buyer using several factors including strategic purchasing, long-term relationship orientation, communication inter-organization, cross-organizational teams and supplier integration (Shin et al., 2000; Cousins and Spekman, 2003).

The application of good supply chain management is to obtain good performance. Several studies suggest a strong relationship between supply chain management on firm performance, such as the study by Craighead, et al. (2009), showed that the supply chain can lead to increased effectiveness of firm financial performance. This result was also similar to the results of the study by Carr and Pearson (1999), Narasimhan and Das (2001), and Greer and Theuri (2012). The aim of this research was to analyze the influence of environmental uncertainty on performance, both the performance of buyer and supplier in pharmaceutical industry in Indonesia. The main question to be examined in this study was "Does the environmental uncertainty influence the performance of suppliers and buyers that are mediated by the strategic supply management in the pharmaceutical industry in Indonesia?". This directly leads us to the following hypotheses and research models:
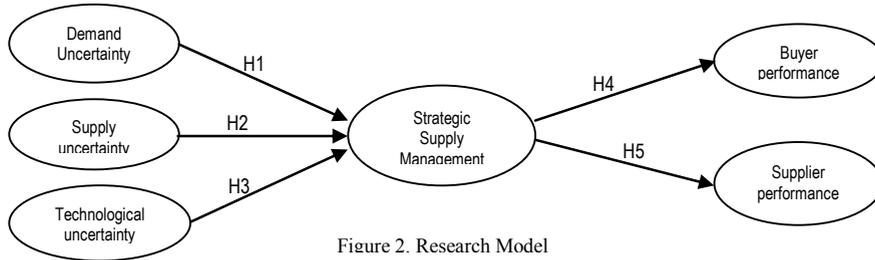
Figure 2. Research Model

2. Methodology

This research was designed as a causal research that tried to find the relationship among variables based on existing theories. The study population was all the pharmaceutical companies in Indonesia. Based on the data from the Indonesian Pharmacists Association, there are 247 pharmaceutical companies in Indonesia (Indonesian Pharmacists Association, 2013). Given the limited number of population, the method of data collection was obtained by census or all members of population were sampled. The data collected in this study are primary data through a mail survey. Stages of data analysis are as follows, validity test using Confirmatory Factor Analysis (CFA), reliability test using Cronbach's Alpha, and hypotheses test using path analysis. In the validity test, convergent validity which can be accepted is an item that has a factor loading greater than 0.40 and significant at the 5% significance level. To find out the reliability of each variable, Cronbach's Alpha and item-to-total correlation is useful to improve the measurement by eliminating grains that can reduce the Cronbach's Alpha. Limitations of reliable variables are above 0.60. There are five variables applied in this research, namely demand uncertainty, supply uncertainty, technology uncertainty, strategic supply management, buyer performance and supplier performance. Strategic supply management is an unobserved variable, which means that the variable cannot be measured directly and require an observed variable. Observed variables for strategic supply management include strategic purchasing, a long-term relationship orientation, inter-organizational communication, cross-organizational teams, and the integration of suppliers.

3. Results and Discussion

The result of validity test showed that there were six indicators in strategic supply management variable that should be excluded from the next analysis because they didn't meet the requirements of validity (factor loading less than 0.40 and not clustered their variable). Therefore, for the next validity test, the six indicators are to be removed. The results of the final factor analysis showed that all items have factor loadings greater than 0.40. This indicate that the instrument used in this study actually measure the real thing and also valid. The next analysis about reliability test showed that all variables have Cronbach's Alpha greater than 0.60. This means that all variables are reliable. The next step was testing the hypothesis using path analysis with three stages of analysis: (1) to analyze the model with the independent variables are supply uncertainty, demand uncertainty, and technological uncertainty with the dependent variable is strategic supply management; (2) to analyze the model with the independent variables is strategic supply management and the dependent variable is suppliers performance; (3) to analyze the model with the independent variable is strategic supply management and the dependent variable is buyer performance. By using statistical models of linear regression, the influence of each variable is showed by $\alpha \leq 0.05$ which means it has a 95% confidence level. The result of path analysis as follows.
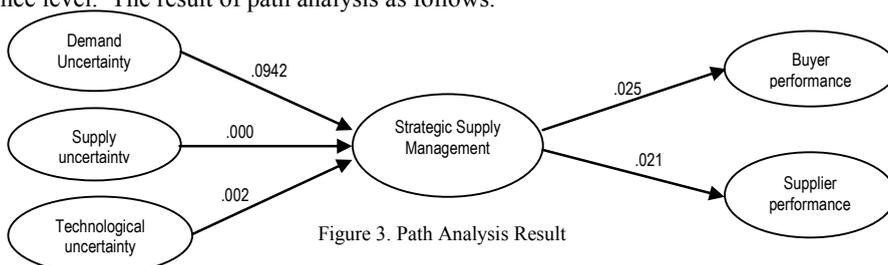

Figure 3. Path Analysis Result

Based on the result of the path analysis, shows that altogether, the independent variables have a significant effect on dependent variables, which means that environmental uncertainty and strategic supply management have a positive influence on performance. However, the value of R^2 in the model is very low at only 0.401 which means that only 40.1% of the variation in strategic supply management can be explained by the variables of supply uncertainty, demand uncertainty and technological uncertainty. However, when seen from the magnitude of the contribution made by each of the independent variables, it can be seen that the variable demand uncertainty is the only independent variable that does not have a significant influence on strategic supply management (has a significance value $\alpha \geq 0.05$ or 0.942. Based on the five hypotheses given, only H1 (influence of demand uncertainty on strategic supply management) was not supported in this research or demand uncertainty is not influence strategic supply management. The condition of pharmaceutical market in Indonesia, which tends to be stable and increase, minimizes the possibility of demand fluctuations. It leads affect that demand uncertainty does not influence strategic supply management. The demand of pharmaceutical products in Indonesia has a constant and increased demand patterns, especially for standard products.

Demand uncertainty is rather different from supply uncertainty. Demand uncertainty is likely not shifted significantly, but not for supply uncertainty. The higher supply uncertainty, the strengthen relationship among supply chain members in the form of vertical integration as well as trying to strengthen its strategic supply management. Indonesia's dependence on imported raw materials as much as 90% suggests that uncertainty affects the supply of strategic supply management of medicines. Similarly, the technological uncertainty affects the strategic supply management. Rapid technological change will further increase the cooperation between supply chain members. Another result of this study was that strategic supply management influence the buyer and supplier performance. Companies that are in the supply chain integration will always strive to improve the competitive advantage that leads to a mutually beneficial partnership. Close cooperation relationship among members of the supply chain will improve their performance by improving business understanding the overall business process (Takeishi, 2001).

4. Conclusion

This study was aimed to analyze the mediating role of strategic supply management on performance in the pharmaceutical industry in Indonesia. Data collection was conducted by sending questionnaires to 247 pharmaceutical companies in Indonesia, and as many as 57 data can processed for further analysis. The questionnaire was developed based on a questionnaire by Paulraj and Chen (2007). Hypothesis testing is done by using path analysis. Before testing the hypothesis, all the indicators were tested through validity test and reliability test. The results of hypothesis testing are performed using path analysis showed that demand uncertainty is the only independent variable that does not affect the strategic supply management. Two other independent variables, namely the supply uncertainty and technological uncertainty was found to have a positive influence on strategic supply management. Similarly, for the influence of strategic supply management on the performance of the buyer and seller performance showed a positive effect. Indonesian people that characterized as average middle income people tend to use standardized pharmaceutical products, including standardized medicines, at affordable prices so that demand for medicines tend to be stable. During the stable demand, the strategic supply management also showed a stable performance. The results of the study by Paulraj and Chen (2007) showed similar results, that there is no significant relationship between demand uncertainties with strategic supply management. Increased demand uncertainty will lead to operations interdependence among supply chain members. This is reinforced by the Indonesian pharmaceutical industry market conditions are likely to be stable.

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