

The Effects of Integrative Supply Chain Management on the Just in Time and Competitiveness of the Food and Beverage Manufacturing Companies in Makassar

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Abstract- This study aims to examine and to analyze the effects of integrative supply chain management (SCM) on competitiveness mediated by the just in time (JIT), taking the Food and Beverages manufacturing companies in Makassar as a case study. This is an explanatory research with the number of respondents of 75 managers of the companies under surveyed. The statistical analysis used to estimate and test the hypotheses is the Generalized Structured Analysis (GeSCA). The study found as follows. First, there is a significant effect of the integrative supply chain management (SCM) on just in time (JIT) and competitiveness of the manufacturing companies under survey. Secondly, the integrative supply chain management has also had a significant effect on industries' competitiveness mediated by just in time. This study, therefore, suggested that both the integrative supply chain management and just in time should be given attention to increase the competitiveness of the Food and beverages manufacturing companies in Makassar, South Sulawesi.

Index Terms— Integrative Supply Chain Management, Just in Time, Competitiveness, Food and Beverage manufacturing companies.

I. INTRODUCTION

Free trade has changed the business paradigm from comparative advantage to competitive advantage. This change forced the business activities or companies to select the right strategy so that they are able to adapt to the changing environment (Chin et al., 2010). However, the effect of this change for Indonesia's competitiveness at least in the last three years was not significant. This was indicated in the Report of the World Economic Forum (WEF) in that Indonesia in terms of the global competitiveness index was still ranked 44th in 2010-2011 and then dropped to the rank 50 in 2011-2013 (Munizu 2011).

To improve the competitiveness, supply chain management (SCM) and just in time (JIT) have been found as the two important variables. As Heyzer and Render (2009; 2010) stated that companies need to consider the issue of supply chains and

just-in-time (JIT) to support the company's competitiveness strategy. This argument was also supported by Ramarapu et al. (1994) in that they argued that just in time is important for the companies improve competitive advantage, both in the domestic market as well as in the global market. Flynn et. al. (1995) further suggested four areas or management practices of organizations in the JIT system, namely, *kanban* control system, lot size reduction, set up time reduction, and JIT scheduling.

In terms of the concept, the supply chain management (SCM) can be defined as the interaction of procurement activities and services, conversion into semi-finished goods and finished products, as well as delivery to the customer (Haizer & Render, 2010). The activities in the supply chain management include outsource purchasing activities, and other functions that are important for the relationship between suppliers and distributors. Whilst Pujawan (2005) defined supply chain management as a network of companies that jointly work to create and deliver a product into the hands of end users.

It should be noted that SCM concept is an extension of the concept of logistics, particularly related to internal integration (Anatan and Elitan, 2008). This integration must be achieved for the entire chain from upstream to downstream. This supply chain integration is an effective coordination between supply chain processes through continuous information flow to the downstream and upstream supply chain (Krajewski et al., 2010). For that reason, the supply chain process must be developed through the integration of suppliers, companies and consumers or internal and external integration (Anatan and Elitan, 2008).

Unlike SCM, Just In Time particularly concern to the production methods which oriented to minimum inventory, machines time set up and short equipment, the creation of workers with multifunctional skills and work completion in the short time cycle in accordance with established standards. Just in time is an approach that seeks to minimize losses or things

that do not add value in the production process (Munjati Munawarah, 2004).

In terms of the competitive advantage, Porter in Zabidi (2001) argued that competitive advantage basically evolved from the capability value created by an organization. There are four dimensions of competitiveness, namely, cost, quality, time delivery, and flexibility. These four dimensions of competitiveness will form the competitiveness of companies in a competitive market (Zabidi, 2001).

On the basis of the above brief background, this study aims to examine and to analyze the effects of integrative supply chain management (SCM) on competitiveness mediated by the just in time (JIT), taking the Food and Beverages manufacturing companies in Makasar as a case study.

However, before the study's findings is discussed, the conceptual and hypotheses of the study is highlighted in section 2. This is followed by the research methods in section 3. Section 4 then discussed the findings of the study. Finally, concluding remarks are drawn in section 5.

II. CONCEPTUAL FRAMEWORK AND HYPOTHESES

It is argued in the literatures that the competitiveness of the food and beverage manufacturing companies in Makasar, South Sulawesi can be determined at least by two factors. These two factors are the management integration of supply chain and just in time. The detail model of this argument can be conceptualized below:

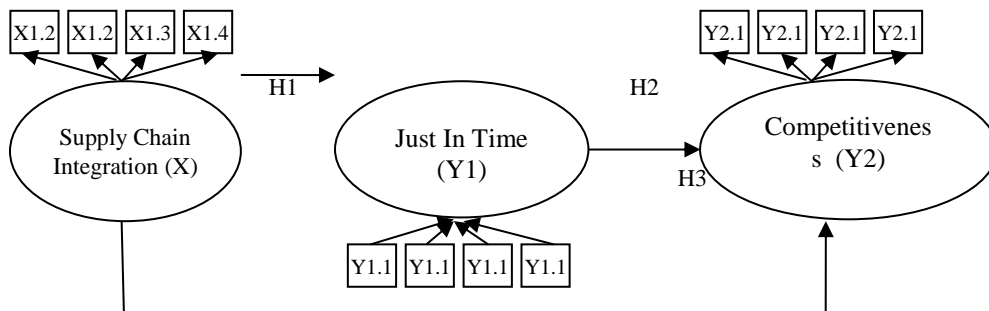


Figure 1. Conceptual Framework

From the above conceptual framework, there are three hypotheses that are going to be tested. These three hypotheses are as follows:

1. Integration of supply chain management has significant effect on just in time.
2. Just in time has a significant effect on competitiveness.
3. The integration of supply chain management has a significant effect on the competitiveness of companies mediated by just in time.

III. RESEARCH METHOD

3.1 Variables and Operational Definition

The data collected using questionnaires were quantified using Likert scale. This Likert scale is used to measure attitudes, opinions and perceptions stated by the respondents under surveyed. Detail variables and indicators of each variables are exhibited at Table 1.

Table 1. Variables and Variable Indicator

No	Variables	Indicator	References	Measurement Scale
	Supply Chain Management Integration (X1)	(X1.1) Information Sharing (X1.2) Internal Integration (X1.3) External Integration	Sakun & Wong, (2011), Hatani (2013)	Interval

		with supplier (X1.4) External Integration with costumers		
	Just In Time (Y1)	(Y1.1) Kanban Control System (Y1.2) Lot Size Reduction (Y1.3) Set Up Time Reduction (Y1.4) JIT scheduling	Sakakibara et.al. (1995), Flynn (1995)	Interval
	Competitiveness (Y2)	(Y2.1) Price (Y2.2) Quality Increasing (Y2.3) Flexibility (Y2.4) Product Innovation	Han et.al (2007), Munizu (2013)	Interval

3.2. Population and Sample

The population of this research is the Food and Beverages manufacturing companies in Makasar, South Sulawesi. These manufacturing companies can be grouped as large-scale manufacturing industries that operated in the city of Makassar. Using the Central board of Statistics (BPS) definition, large-scale manufacturing industry is defined as a company that has the number of their employees or employees of more than 100 people (BPS, South Sulawesi 2011).

Note that the selection of Makassar as the object of this study was because the city of Makasar is the central of industry in the eastern part of Indonesia. The manufacturing industries under surveyed were both the medium and large industries located in the Industrial Area in Makassar. The number of the industries under sample surveyed was 240 manufacturing industries producing food and beverages products.

3.3. Data Collection Technique and Data Analysis

Methods of data collection are by undertaking quantitative survey using questionnaires. These questionnaires were given to the directors and managers at each company. The study also collected data and information using In-depth Interviews. These in-depth interviews were used to support and detail the data collected using questionnaires. In addition, documents that are relevant to study were sourced from companies, web sites, and related agencies.

The data was then further analyzed using the Likert scale analysis. These data were then estimated using the Generalized Structured Component Analysis (GSCA). GSCA is a method of SEM-based components, which can be applied to a very small sample (Solimun, 2012). The goodness fit of the model is shown at Table 2.

Table 2. Evaluation of Goodness-of-fit and Overall Structural Model of GSCA

Model Fit	
FIT	$\geq 0,60$
AFIT	$\geq 0,60$
GFI	$\geq 0,90$
SRMR	$\leq 0,10$

Source: Solimun (2012)

IV. RESULTS AND DISCUSSION

As it has been stated that the respondents in this research are managers of the Food and Beverages manufacturing companies in Makasar. The characteristics of these respondents were grouped based on gender, age, marital status, educational level, the length of working age, and their position in the company. Of the total respondents of 120 respondents selected as the sample survey, only 75 of them completed the questionnaires that were given to them.

In terms of gender, for instance, it was found that about 69 percent are male. Whilst in terms of age, about 47 percent are above 41 years old. The educational level of the respondents was dominated by those with bachelor degree at about 43 percent. Most of the managers under sampled survey have the working age between 11-20 years (56%).

The variables in this study consisted of three (3) variables. The independent variable of Integration of Supply Chain was indicated by four indicators, namely, sharing information, internal integration, supplier integration, and customer integration. The variable of Just In Time was also indicated by four indicators, that is, a kanban control, lot size reduction, setup time reduction, JIT scheduling. The variable of competitiveness consist of cost competitiveness, quality, flexibility, and product innovation indicators. The detail description of respondents based on variables was shown at Table 3.

Table 3. Detail description of respondents based on variables

No	Variable	Average	Description
1	Integrasi SCM	4,15	High
2	Just In Time	3,74	Fair
3	Competitiveness	4,31	Very High

Source: Calculated from the data.

Table 3 above indicates that the average indicators in the variable integrative supply chain was in the high category (4.15), just in time variable was in fair category (3.74), and the variable competitiveness was the category of very high (4.31).

Further, using the Generalized Structured Analysis (GeSCA), it was found that the Goodness of fit indices (GFI) of the model estimated are as follows (Table 4).

Table 4. Evaluation of Goodness-of-fit and Overall Structural Model

GeSCA

Test criteria	Cut off value	Results	description
FIT	$\geq 0,60$	0,720	Good
AFIT	$\geq 0,60$	0,706	Good

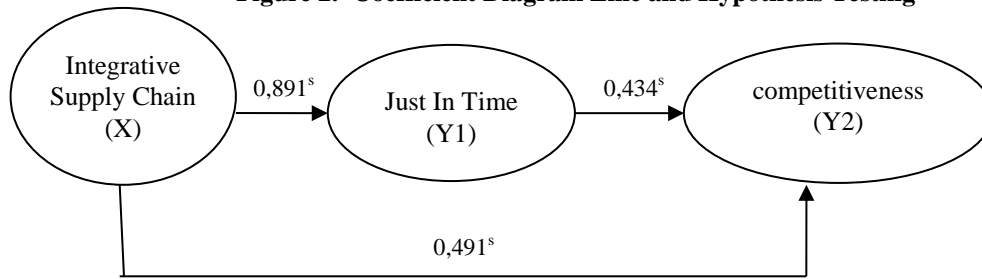
GFI	$\geq 0,90$	0,989	Good
SRMR	$\leq 0,10$	0,093	Good

Source: estimated from the data.

As shown at Table 4, all test of the goodness-of-fit of the structural model and the overall model using the FIT test, AFIT test, GFI test, and SRMR test indicated that the model specified in this study could explain 72.00% of variance data that has been corrected. Similarly, the value of GFI with the value of 0.989 and SRMR with the value of 0.093 indicate that the model was fit as they have GFI greater than 0.90 and SRMR close to zero.

The study also found that the hypothesis tested and the path coefficient of variables under study shown relevant results as expected. In terms of the direct path coefficient, for instance, it shows that the path coefficients and critical point (CR *) of the variables were significant at alpha 5 percent (see Figure. 2).

Figure 2. Coefficient Diagram Line and Hypothesis Testing



The contribution of the effects of the variables is as follows. The integration of supply chain management, for instance, has contribution effect of 89.1 percent on just in time. Also, it affects significantly on the competitiveness by

49.1 percent. Whilst the just in time has a significant effect on the competitiveness by 43.4 percent. In terms of hypothesis testing, the results are exhibited at Table 5.

Table 5. The Coefficients and Hypothesis Testing Results

Hypotheses		Direct effect	Path Coefficients	C.R (t-test)	Results	
Partial	H ₁	<i>Integrative Supply Chain management → Just In time</i>	0.891	26.03*	Significant	Accepted
	H ₂	<i>Just In Time → Competitiveness</i>	0.434	4.30*	Significant	Accepted
	H ₃	<i>Integrative Supply Chain management → Competitiveness</i>	0.491	4.74*	Significant	Accepted

Note: CR* = Significant at $\alpha = 0,05$

Source : estimated from GSCA.

The result exhibited at Table 5 confirms that the integration of supply chain management has positive and significant effect on just in time. This means that the change of the integration management of supply chain will have positive and significant effect on just in time. This result supports the previous study conducted by Anatan and Elitist (2008) in which they found that the integration with suppliers can help companies to reduce production time, and served to increase the performance of the supply chain.

The study also found that there is a positive and significant effect of just in time via kanban control system and quality performance on the competitiveness of the manufactures under survey. This finding is consistent with the previous of studies conducted by Flynn et al. (1995), Golhar & Stamm, (1991), Alshbiel, and Al-Awawdeh (2012) and White et al. (1999) to name just a few. They found that the kanban control system has a positive effect on firm performance shown by the increased quality of internal and external quality. Thus, this suggests that the higher the practice of just in time, the higher will be competitiveness of the manufacturing of Food and Beverages in the city of Makassar.

The supply chain management has positive and significant effect on competitiveness of the Food and Beverage manufacturing companies under survey. This is shown from the significant value of α less than 5 per cent. This finding supports the previous studies undertaken by Chopra and Meindl (2001), Li, B. Ragu-Nathan et al, (2006), Gimenez and Ventura (2004; 2005), Chin Liu et al. (2010) and Sakun Wong et al. (2011). Thus, this study can be once again confirmed the previous studies that the management integration of supply

chain via just time has positive and significant effect on competitiveness of the Food and Beverages companies in Makasar, South Sulawesi.

V. CONCLUDING REMARKS

This study aims to examine and analyze the effects of integrative supply chain management (SCM) on competitiveness mediated by the just in time (JIT), taking the Food and Beverages manufacturing companies in Makasar as a case study. The findings of this study confirm that the Integration of Supply chain management has positive and significant effects on the practice of just-in-time. This suggests that better interactions made by the company with suppliers and customers in a sharing of information, and the response to the customer is able to improve the practice of just in time.

Also, the better integration of supply chain management, the higher will be the company's competitiveness. This means that the sharing of information and the integration of the supply chain that exists between the company with suppliers and customers can enhance the company's ability to perform quality product on competitiveness. Similarly, Just in time also played positive and significant effect on the competitiveness of enterprises.

Due to the above findings, a great and serious concern need to be given to the integration management of supply chain via just in time in order to increase the competitiveness of the Food and Beverages companies. This for instance can be done by integrating both internal and external management as well as their flexibility as these aspects was still found ineffective. Also, it is important for the companies to shift its material ordering from the present traditional method to modern one so

that it will lower the cost and shorten the reservation time. In addition, the companies also need to improve the just in time practice to minimize the lot size and time setup. Finally, the companies need to minimize the direct cost of production by improving the kanban system control and reduce lot size and time setup in production. Finally, there is a need to have a better JIT scheduling in order to reduce the cost inefficiency by providing quality products in accordance with the needs and expectation of customers.

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