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THE EFFECT OF SUPPLY LOGISTICS INTEGRATION ON SUPPLY PERFORMANCE AND COMPETITIVE PERFORMANCE IN JEDDAH, SAUDI ARABIA

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ABSTRACT

Supply Logistics Integration provides an effective connection between organizations in order to facilitate smooth material to product process. The purpose of this paper is to investigate the relationship between supply logistics integration, supply performance and competitive performance. Data collected from 81 respondents from 22 firms in Jeddah via online questionnaire survey are used for analyzing the relationship between the study variables. Reliability test is used to test the validity of the variables and measures of the study. On the other hand, Regression analysis is used to test the hypotheses and correlation matrix is used to examine the relationships between each of the three variables. According to the obtained results of reliability test, all study variables are valid to be applied. Moreover, correlation matrix has proved that there is positive correlation between the variables. The results of linear regression analysis support the hypothesis that all variables have positive effect on each other's. The construct of supply logistics integration developed in this study reveals significant impact on supply performance and competitive impact.

INTRODUCTION

Integration between companies' supply chain systems is vital for improving the performance [1]. Supply chain management coordinates business processes involving sourcing, production, logistics and distribution in order to deliver the end product to the end customer [2]. Mentzer (2001) pointed that supply chain management (SCM) affects the performance of the company significantly as it includes the movement of information, materials, products and money within and across the company [3]. Companies tend to integrate

their systems to facilitate the flow of information, materials, and other resources, thus, to build competitive advantage to the firm and across suppliers, customers, and other business partners, hence creating value by reducing costs and increasing customer satisfaction. Supply logistics integration is defined as establishing links through firms and suppliers to facilitate the flow of materials which reflect on having a smoother production process [4].

The integration of firm logistics processes between supplier and buyer requires integrating both parties' information and coordinating their activities as well, to create high visibility and flow of information between the two parties accordingly [5]. The high integration of logistics processes between supplier and buyer firm's strategic resources will assist in developing processes, capabilities and relationships that are implicit and impalpable, invisible and difficult to copy by competitors [6]. In other words the higher logistics integration between suppliers' tasks the more competitive advantage will be achieved. Supply logistics integration involves establishing links between firms and suppliers to facilitate the flow of materials which reflect on having a smoother production process [4]. Logistics integration lead to plentiful benefits that extends to both buyers and suppliers including improvement of product quality, reduction in cost and time response, and improving operational competencies [7]. In fact, many studies have been conducted proves the positive relationship between supply chain integration and performance [8]. Frohlich and Westbrook (2001) as well as Kannan and Tan (2010) argued that the highest integration result in a strong relationship with performance improvement [4, 9]. On the other hand, Sheu et al. (2006) argued that higher levels of logistics interaction lead to high supply chain system operational efficiencies [10]. Li et al. (2005) noted a significant correlation between supply chain integration and supply chain performance [11].

(Inbound) supply performance involves performing many processes like sourcing, procurement and operations related to logistics including carrying costs of inventory and materials [6]. Supply logistics integration involves the assurance of materials arrival with right quantity, time and quality to initiate the production process, and improving (inbound) supply performance subsequently [6]. Integrated supply logistics processes comprise establishing links between supplier and firms to maintain a rapid movement of materials, thus, improving supply management performance [12]. In contrast, only few studies have investigated the relationship between supply logistics integration and (inbound) supply performance. Shin et al. (2000) noted that supply management impacts supplier performance positively in terms of high quality, low cost and quick delivery [13]. Tan et al. (1998) concluded that the relationship between SCM and buyer's performance is mediated by supplier performance [14]. However the relationship between logistics integration and inbound supply performance has not been empirically examined.

Previous studies have suggested the direct effect between inbound performance and competitive performance [15, 16]. The quality of raw materials, delivery process and costs has a direct effect on the quality of the end item and final customer experience too [17]. For instance, Pagell (2004)

agreed on the positive effect between the delivery speed from supplier to buyer and the end customer [18]. Vonderembse and Tracey (1999) found that high supplier performance is an indicator of high manufacturing performance [19]. Likewise Shin et al. (2000) study has proved the positive effect between supplier performance and buyer's performance [13]. Therefore, the improvement of buyer-supplier relationship performance reflects buying firm consideration positively [20].

Integration of logistics provides plentiful benefits that extend to both buyers and suppliers including improvement of product quality, reduction in cost and time response, and improving operational competencies [7]. Therefore, this paper seeks to investigate the effect of supply logistics integration on supply performance and competitive performance, by identifying the relationship between Supply logistics integration and Competitive performance, the relationship between Supply logistics integration and Supply performance as well as the relationship between Supply performance and Competitive performance.

METHODOLOGY

Methodology helps to formulate the questions require for the research, also develop the hypotheses and selecting the sample groups. Therefore, it's helpful when collecting data and analyzing the result of the research [21]. This study applied two types of methods which are qualitative method and quantitative method.

Primary Data

Primary research data is referring to the research which has been collected and used for firsthand experience for specific data research [22]. In this study, the questionnaire was filled by 81 employees from 22 companies.

Secondary Data

Secondary data refers to the data that has been obtained from the previous research. The secondary data used in this study are classified as book, peer reviewed journals and published article

Sample Size

Sampling is a subset of selecting the group of people from the population to observe and investigate in order to help the researcher to have a view about people's perceptions. Population sampling is a small group of people selecting to answer relevant questions for the research [23]. Sampling develops the procedure for selecting group of people, or selecting by the random sample of the population [24]. This study covers a sample size of 81 employees from different 22 companies. The participated companies in this study are shown in Table 1.

Table 1. Name Of Company

No.	Name of Company	No.	Name of Company
1	Al Marai- Dairy Company	12	Kuehne + Nagel
2	Al Nahdi	13	L'Oreal
3	Al Sunbulah	14	Mosanada Logistics Services
4	Al Wefag Company	15	Munch Bakery
5	ALJ	16	Nestle
6	AMS Baeshen Company	17	Rana Food Company
7	ARASCO	18	SADAFCO
8	Banajah Company	19	SAJA
9	Fedex	20	Savola Group-United Sugar Company
10	IKEA	21	Savola Group-Panda Retail Company
11	Jiser	22	Tamer

Data Collection

The first-hand information is gathered by distributing the prepared questionnaire to 22 companies through company visits, LinkedIn, and personal emails. There are about 81 employees have successfully completed the questionnaire survey.

Data Assessment

The respondents are required to assess their firm's performance with a scale ranging from 1 (weakest performance) to 5 (strongest performance). Three scales were used to measure the three variables which are Supply Logistics Integration, Supply Performance and Competitive Performance.

For logistics integration, the respondents are requested to assess the integration of their logistics activities [7, 25]. For inbound supply performance, the respondents are requested to assess their performance in reduction of inventory carrying costs, incoming material costs, supplier rejection rate and the percentage of late or wrong supplier deliveries [25, 26]. Furthermore, the measure of competitive performance captures the four main competitive aspects like quality, speed of delivery, flexibility (including variety and volume) and costs [11, 25, 27, 28].

The data collected from this questionnaire will be analyzed using Excel then SPSS software in order to explore the relationship between the three variables

namely Supply Logistics Integration, Supply Performance and Competitive Performance.

Research Hypotheses

H1: There is a positive effect of Supply Logistics Integration on Supply Performance.
H2: There is a positive effect of Supply Logistics Integration on Competitive Performance.
H3: There is a positive effect of Supply Performance on Competitive Performance.

RESULT AND DISCUSSION

The goal of this study was to investigate the effect of supply logistics integration on supply performance and competitive performance, by identifying the relationship between "Supply Logistics Integration" and "Competitive Performance", "Supply Logistics Integration" and "Supply Performance", furthermore identifying the relationship between "Supply Performance" and "Competitive Performance". This chapter summarizes the findings of a survey sent out to 81 employees from 22 companies in order to investigate employees' perceptions about their firm's performance yet to examine the relationship between the three variables. The analysis are presented to analyze the primary data has been collected.

Reliability Analysis

The goal of applying reliability analysis was to test the reliability and applicability of the 14 items (statements) used in measuring the three variables. Reliability is described as the tendency towards consistency of performance and responsibility. Cronbash's alpha is applied through internal consistency to test how items are closely related to each other and to measure the scale reliability.

Cronbash's Alpha

Alpha coefficient ranges from the value of 0 to 1, as stated by Nunnaly (1978) that the acceptable reliability coefficient is 0.65 [29]. Table 2 demonstrates the sum up value of Cronbash's alphas per checking the reliability for the variables in this study. According to Table 2, the variables "Supply Logistics Integration", "Supply Performance" and "Competitive Performance" have an acceptable level of reliability (Cronbash's Alpha > 0.65). To sum up, the alpha coefficients for the three variables are above 0.65 which means that the reliability of the measures applied are acceptable.

Table 2. Reliability Test For The Three Variables

Variables	**Cronbash's Alpha**
Supply Logistics Integration	0.860
Supply Performance	0.752
Competitive Performance	0.861

HYPOTHESES TESTING

Correlation Matrix

Correlation matrix has been applied in order to investigate the link between the variables of the current study (Supply Logistics Integration, Supply Performance and Competitive Performance). Correlation matrix is a tool that provides the correlations between the variables of a study. Correlation Matrix provides the Pearson's Correlation Coefficient between the study variables generally and between each two variables specifically, to assist in evaluating the relationship between these variables. Moreover, the value for Pearson's correlation can be ranged from 0 (No correlation) and 1 (Perfect correlation). The purpose of applying Pearson correlation analysis and descriptive statistics is to provide analysis and test the direct relationship between the independent and dependent variables [30].

Table 3 shows the Correlation Matrix between the study variables, the value of Pearson Correlation represents the relationship between each two variables of the study, however; the flagged variables represent the significant correlation. According to Table 3, the correlations between the variable "Supply Logistics Integration" and "Supply Performance" , "Supply Logistics Integration " and "Competitive Performance" , "Supply Performance" and "Competitive Performance" are 0.721, 0.779 and 0.763 respectively. These values refer to positive, significant relationship between all the above variables in general and between each two variables particularly.

Table 3. Correlation Matrix For The Variables

		Supply Logistics Integration	Supply Performance	Competitive Performance
Supply Logistics Integration	Pearson Correlation	1	.721**	.779**
	Sig. (2-tailed)		.000	.000
	N	74	70	63
Supply Performance	Pearson Correlation	.721**	1	.763**
	Sig. (2-tailed)	.000		.000
	N	70	70	63
Competitive Performance	Pearson Correlation	.779**	.763**	1
	Sig. (2-tailed)	.000	.000	

	N	63	63	63

** Correlation is significant at the 0.01 level (2-tailed)

Regression Analysis

Regression analysis is a statistical method that aims to estimate the relationship between the variables. It assists in analyzing and modeling many variables, specifically between a dependent variable and one or several independent variables. In this section the regression analysis will be presented in order to test the hypotheses of the current study.

Simple Linear Regression Analysis For Supply Logistics Integration And Supply Performance

A Simple linear model is fitted between Supply Logistics Integration as an independent variable and Supply Performance as a dependent variable in Table 4. It was found that the model coefficient of determination (R Square) equals 52%, which means that the model explains 52% of the variance in Supply Performance, or that 52% of the variation in the dependent variable can be explained due to the variation in Supply Logistics Integration. Also, the overall statistical significance of the model reveals that the model is significant with P-Value=0.000 (P-Value < 0.05). Therefore Hypothesis 1 is accepted. There is a positive effect of Supply Logistics Integration on Supply Performance.

Table 4. Model Summary

Variable	**R2**	**Beta Coefficient**	**Significant**
Supply Logistics Integration	.520	.721	.000

Dependent Variable: Supply Performance
R2=52%

Simple Linear Regression Analysis Of Supply Logistics Integration And Competitive Performance

A Simple linear model is fitted between Supply Logistics Integration as an independent variable and Competitive Performance as a dependent variable in Table 5. It was found that the model coefficient of determination (R Square) equals 60.8%, which means that the model explains 60.8% of the variance in Competitive Performance, or that 60.8% of the variation in the dependent variable can be explained due to the variation in Supply Logistics Integration. Also, the overall statistical significance of the model reveals that the model is significant with P-Value= 0.000 (P-Value < 0.05). Therefore Hypothesis 2 is accepted. There is a positive effect of Supply Logistics Integration on Competitive Performance.

Table 5. Model Summary

Variable	R2	Beta Coefficient	Significant
Supply Logistics Integration	.608	.779	.000

Dependent Variable: Competitive Performance
R2=60.8%

Simple Linear Regression Analysis Of Supply Performance And Competitive Performance

A Simple linear model is fitted between Supply Performance as an independent variable and Competitive Performance as a dependent variable in Table 6. It was found that the model coefficient of determination (R Square) equals 58.2 %, which means that the model explains 58.2 % of the variance in Competitive Performance, or that 58.2 % of the variation in the dependent variable can be explained due to the variation in Supply Performance. Also, the overall statistical significance of the model reveals that the model is significant with P-Value= 0.000 (P-Value < 0.05). Therefore Hypothesis 3 is accepted. There is a positive effect of Supply Performance on Competitive Performance.

Table 6. Model Summary

Variable	R2	Beta Coefficient	Significant
Supply Performance	.582	.763	.000

Dependent Variable: Competitive Performance
R2= 58.2%

To sum up, all measures applied are valid for measuring the variables of the study. Furthermore, based on regression and correlation tests all variables will be accepted.

CONCLUSION

This study evaluated the effect of supply logistics integration on supply performance and competitive performance. The results of this study support the hypotheses that Supply logistics integration, Supply Performance and Competitive Performance have a positive impact on each other's. The findings suggest that higher levels of logistics interaction lead to high supply chain system operational efficiencies. In other words, the high integration of logistics processes between supplier and buyer firm's strategic resources will assist in developing processes, capabilities and relationships that are implicit and impalpable, invisible and difficult to copy by competitors. The findings of

this study assure that integrating companies' Supply Chain Management systems an effective way of improving the process of flowing materials within and across the company, improving product quality, improving operational competencies, thus improving the company performance extensively.

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