

## A STUDY OF SUPPLY CHAIN MANAGEMENT PRACTICES: AN EMPIRICAL INVESTIGATION ON CONSUMER GOODS INDUSTRY IN MALAYSIA.

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### ABSTRACT

*The purpose of this research is to present the relationship between supply chain management (SCM) practices and supply chain responsiveness (SCR), and investigates its relationship with competitive advantage (CA). The data collection instrument used was a questionnaire which was administrated to a total sample of 200 managers. The response rate was 70% while 60% was usable questionnaires. Sample selection was based on convenience sampling. The analyses involved statistical methods such as reliability and validity tests and multiple regressions. The results indicated that SCM practices are related to SCR. The result also suggested that SCR is related to CA.*

### 1. Introduction

In today's competitive business there is an increased focus on delivering value to the customer. The focus on attention of most of businesses is providing products and services that are more valuable compared to its competitors. Concurrent to the focus on customer value, the marketplace in which businesses operate today is widely recognized as being complex and turbulent (Christopher, 2000; Goldman *et al.*, 1995). The growth of supply chain aims to improve profitability, customer response and ability to deliver value to the customers and also to improve the interconnection and interdependence among firms. Due to market expanding from domestic market to global market increase customer demands, for instance demanding lower prices, faster delivery, higher quality products or services and increase the variety of items (Braunscheidel, 2005). According to Towil and Christopher, (cited in Thatte, 2007), the end customer in the marketplace today determined by the success of failure of supply chains management practices. They stated that getting the right product, at the right price, at the right time to the customer is not only improved competitive success but also the key to survival.

Many previous researches explored the importance of integrating suppliers, manufacturers, and customers or supply chain integration (Frohlich and Westbrook, 2001; Clinton and Closs, 1997) (i.e. supply chain management) so as to obtain flexibility and speed. By addressing supply chain management practices that contribute to supply chain responsiveness, will help the researcher better understand the scope and activities related to supply chain management that create enhanced level of supply chain responsiveness in competitive business marketplace. The purpose of this study to find out the effect of supply chain management practices such as strategic supplier partnership, customer relationship, information sharing and supply chain responsiveness. This study also investigates the effect of supply chain responsiveness in term of operation system responsiveness, logistic process responsiveness, supplier network responsiveness and competitive advantage of the firm. The paper is organized as follows. Relevant literature is reviewed and synthesized first to develop a conceptual model, followed by research methodology. The results are then presented along with discussion. Conclusion and implication are discussed finally.

### 2. Literature Review and Hypotheses

The research objectives in this study were designed to investigate the effect of supply chain management practices in terms of strategic supplier partnership, customer relationship, and information sharing on supply chain responsiveness and to determine whether supply chain responsiveness has impact on competitive advantage of the firm. Within these objectives, there are three concepts that needed to be explored, to obtain an understanding of these objectives. These concepts are reviewed both supplier and customer (externally) and internally.

These concepts are (1) supply chain management practices that encompasses supplier partnership, customer relationship and information sharing, (2) supply chain responsiveness that includes operation system responsiveness, logistic process responsiveness, and supplier network responsiveness, (3) competitive advantage of the firm. Supply chain management practices as a multi-dimensional construct that encompasses upstream and downstream sides of supply chain (Li et al, 2006). Donlon (1996) stated that outsourcing, supplier partnership, information sharing, cycle time, compression and continuous process flow, as a part of supply chain management practices. While Tan et al (1998) represented supply chain management practices in form of quality, purchasing, and customer relationship. Alvarado and Kotzab, in their empirical study focused on supply chain management practices on inter-organizational system used, core competences, and elimination of excess in inventory through postponement. The key aspect of supply chain management practices according to Tan et al (2002) were supply chain integration, information sharing, customer service management, geographic proximity, and JIT capabilities. Lee (2004) focused on five practices at supply chain level that are a key to create supply chain responsiveness. They includes outsourcing, strategic supplier partnerships, customer relationship, information sharing, and product modularity.

Chen and Paulraj (2004) also conduct the research regarding supply chain management practices, they investigated long-term relationship, cross-functional teams, supplier base reduction, and supplier involvement. The same with Chen and Paulraj, Min and Mentzer (2004) also examined in their study long-term relationship, information sharing, cooperation process integration and supply chain leadership underlying the supply chain management practices. Lie et al (2005,2006); Thatte (2007) identified supply chain management practices in form of strategic supplier partnership, customer relationship, and information sharing. This research adopts the same supply chain management practices (supplier partnership, customer relationship and information sharing). However, this study conducted in Malaysia perspective, especially in consumer goods industry. Li et al (2005); Thatte (2007) have developed a valid and reliable instrument to measure supply chain management practices. The similar instrument also adopted in this research. The literature also depicts supply chain management practices from different perspectives with goal of improving competitive advantage of firm. By improving competitive advantage of the firm, organization could improve its performance. Three dimensions of supply chain management practices lead to supply chain responsiveness.

These are strategic supplier partnership, customer relationship, and information sharing also identified. A supply chain is a network of organizations to perform a variety of processes and activities to generate value in the form of products and services to end consumers. (Christopher, 1992). SCM involves an integrated and process-oriented approach to the management, design and control of the supply chain, with the aim of producing value for the end consumer, by both customer service and reduce cost (Bowersox and Closs, 1996; Giannoccaro and Pontrandolfo, 2002). The supply chain management has dual purpose, in one side is to improve the performance of an individual organization as well as that of the entire supply chain. In other side the supply chain management reduces organization total cost (Li et al, 2006). Supply chain management (SCM) is the discipline which is relatively new and lack of theoretical conceptual framework of established or accepted methodology in general. Lambert, *et al.*, (1998) observed that "the term of SCM was originally introduced by consultants in the early 1980s. Since the early 1990s, scholars have attempted to give structure to the development of SCM. Although the short story of this field, but the SCM literature has grown rapidly (Larson and Rogers, 1998). Shapiro (2001) showed that the SCM combining concepts from different disciplines such as strategic management and theory of the formation of the company; logistics, production and inventory management; accounting management; scientific forecasting and marketing, and operations research.

Supply chain management (SCM) is one of business strategy increasingly being used in the business world today and has become the focus of academic attention in recent years (Ballou, Gilbert & Mukherjee, 2000). Because the concept of SCM is still in development, there are several theoretical frameworks and research methodologies need to be developed in the study of SCM (Tage, 1999). However, many articles have been published in various disciplines to try to define the SCM and discuss future directions and the corresponding empirical research methodology (Cooper, *et al.*, 1997; Lambert & Cooper, 2000; Larson & Rogers, 1998; Tage, 1999).

According to Lummus and Vokurka (1999) SCM as all activities involved in delivering products from raw material to customer, including sources of raw material and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to customers and information systems required to monitor all activity.

Bowersox and Closs (1996) showed that to be fully effective in current's competitive business, companies must develop their integrated behavior to incorporated customers and suppliers. This expansion of integrated behaviors, through external integration, referred to by Bowersox and Closs (1996) as supply chain management. The philosophy of supply chain management turns into the implementation of SCM: a set of activities that carries out the philosophy. The set of activities are coordinated effort called supply chain management between the supply chain partners, such as suppliers, manufactures and customers (Greene, 1991). Thatte (2007) stated that strategic supplier partnership as the long-term relationship between the organization and its supplier. Gunasekaran et al (2001) asserted that a strategic partnership emphasizes long-term relationship between trading partners and promote mutual planning an problem solving efforts. Strategic partnership between organizations promote shared benefits and ongoing collaboration in key strategic areas like technology, products, and market (Yoshino and Rangan, 1995; Thatte, 2007). Strategic partnerships with suppliers lead organization working closely and effectively with a few suppliers rather than many supplier that have been selected on the basis of cost efficient. Many advantage of consisting supplier early in the product-design process are that suppliers can offer cost effective design alternative, assist in selecting better components and technologies, and aid in designing assessment (Tan et al, 2002; Thatte, 2007).

In supply chain management strategies, supplier relationship activities play an important role (Wisner, 2003). Long-term relationships refer to intention that the arrangement is not going to be temporary (Chen and Paulraj, 2004). Through close relationship supply chain partners are willing to share risks and reward, and maintain the relationship on long term basis (Landeros and Monczka, 1989; Cooper and Ellram, 1993; Stuart, 1993; Thatte, 2007). Toni and Nassimbeni (1999) identified that a long-term perspective between the buyer and supplier increase the intensity of firm-supplier integration. Firms that integrate with customers including: planning, implementing, and evaluating a successful relationship between the provider and recipient of both upstream and downstream of the supply chain. Therefore, customer relationship management (CRM) is not only focused on inbound customer relationships but also on outbound customer relationships in SCM. Customer relations related to the company's ability to communicate to the delivery of appropriate products and services to customers locally and globally in the right time, right place, and appropriate of quantity and quality. Customer linkage especially sharing product information with customers, receiving customer orders, interact with customers to manage demand, after placing the order system, share the status of orders with customers on scheduling orders, and product delivery stage (Lee, *et al*, 2007).

A firm's customer relationship practices can generate the organizational success in supply chain management practices efforts as well as its performance (Scott and Westbrook, 1991; Ellram, 1991; Turner, 1993). The success of supply chain management encompasses customer integration at the downstream and supplier integration at the upstream, considering that each entity in a supply chain is a supplier as well as a customer (Tan et al., 1999; Thatte, 2007). In the competitive business, better relationship management with customers is crucial for organization success (Wines, 1996). Good relationship with business partners, including key customers are important role to success of supply chain management practiced by organization (Moberg et al, 2002; Tathee, 2007). Customer relationship recognized as an internal component of an organization's market strategy to increase sales and profits (Bommer et, 2001; Thatte, 2007). Close customer relationship allow product differentiation from competitors, help sustain customer satisfaction and loyalty, and elevated the value provide to customer (Margaretta, 198; Thatte, 2007).

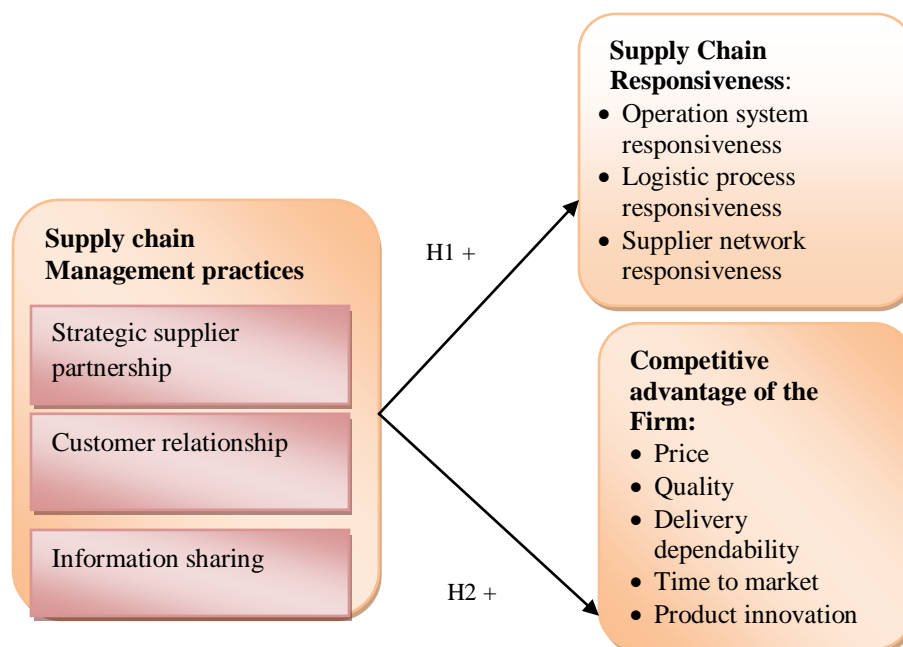
Simatupang and Sridharan, (2002) defined information sharing as the access to private data between business partners thus enabling them to monitor the progress of products and orders as they pass through various processes in the supply chain. They identified some of element that comprise information sharing, consisting data acquisition, processing, storage, presentation, retrieval, and broadcasting of demand and forecast data, inventory status and location, order status, cost-related data, and performance status. They also add that information sharing pertaining to key performance metric and process data improves the supply chain visibility thus enabling effective decision making. Information shared in a supply chain is of use only if it is relevant, accurate, timely, and reliable (Simatupang and Sridharan, 2005;Tathee, 2007). Information sharing with business partners enables organizations making better decisions and making action on the basis of greater visibility (Davenport, et al, 2001; Tathee, 2007). Lumnus and Vokurka (1999, cited in Thatte, 2007) stated that in order to make the supply chain competitive, a necessary first step is to acquire a clear understanding of supply chain concepts and be willing to openly share information with supply chain partners. In business competitive world nowadays, business organization should to develop their supply chain in order to get customer responses.

According to Thatte, (2007) the sub-constructs for supply chain responsiveness includes operation system responsiveness, logistic process responsiveness and supplier network responsiveness. Operation system responsiveness is the ability of firm’s manufacturing system to address changes in customer demand. Its includes both manufacturing and service operation. Duclos et al (2003); Lumnus et al (2003) emphasize that responsiveness at each company of the chain is an integral component of supply chain responsiveness. Logistic process responsiveness is the ability of company’s outbound transformation, distribution and warehousing system to address changes in customer demand. Fawcett (1992) stated that the responsive in logistic process is a crucial component in the supply of a responsive supply chain strategy. Logistics and distribution management encompasses the transformation activities of goods from suppliers to manufacturer to distribution centers to final point of end users (Ricker and Kalakota, 1999; Duclos et al, 2003; Thatte, 2007).

These activities include warehousing, packaging and shipping, transportation planning and management, management inventory, reserve logistics and order tracking and delivery. Supplier network responsiveness is the ability of the firm’s major suppliers to address changes in the firm’s demand. A key to responsiveness is the presence of responsive and flexibility partners upstream and downstream of the firm (Christopher and Peck, 2004). The ability of the firms to react quickly to customer demand is depending on the reaction time of suppliers to make volume of changes. In the changing world, competitive advantage emerges from the creation of supplier competencies to create customer value and achieve cost and/or differentiation advantages, resulting in market share and firm profitability (Barney, 1991; Coyne, 1986; Day and Wensley, 1988; Prahalad and Hamel, 1990, Thatte, 2007). To obtain competitive advantage, firms need to set up barriers that make imitation difficult through continual investment to improve the firm advantage, making this a long-run cyclical process (Day and Wensley, 1988; Thatte, 2007).

Souza and William (2000) suggested that cost and quality is a part of competitive advantage dimension. Wheelwright (1978) and Thatte (2007) also suggested cost, quality, dependability and speed of delivery as some of the critical competitive priorities for manufacturing. (Vokurka et al., 2002; Fawcett and Smith, 1995; White, 1996; Skinner, 1985; Roth and Miller, 1990; Tracey et al., 1999, Thatte, 2007) described the competitive advantage dimensions included price/cost, quality, delivery dependability, and time to market. (viz: Stalk, 1988; Vesey, 1991; Handfield and Pannesi, 1995, Kessler and Chakrabarti, 1996; Zhang, 2001). Koufteros et al. (1997); describe the following five dimensions of competitive capabilities: competitive pricing, premium pricing, value-to-customer quality, dependable delivery, and product innovation. Thatte (2007) suggested that dimension of competitive advantage: price, quality, delivery dependability, time to market, and product innovation. These dimensions, author used in this research.

Based on the above literature review, the following research framework can be drawn



**Figure 1: Proposed research framework**

This study examines the supply chain management practices that consist of strategic supplier partnership, customer relationship and information sharing and its relationship to supply chain responsiveness. Hence, the following hypotheses will be tested:

*H1 : Supply chain management practices are positively related to supply chain responsiveness*

*H1a : Strategic supplier partnership is positively related to supply chain responsiveness*

*H1b : Customer relationship is positively related to supply chain responsiveness*

*H1c : Information sharing is positively related to supply chain responsiveness*

We proposed that supply chain management practices that consist of strategic supplier partnership, customer relationship and information sharing and its relationship to competitive advantage of the firm. Hence, the following hypotheses will be tested:

*H2 : Supply chain management practices are positively related to competitive advantage*

*H2a : Strategic supplier partnership is positively related to competitive advantage*

*H2b : Customer relationship is positively related to competitive advantage*

*H2c : Information sharing is positively related to competitive advantage*

### 3. Sampling and data collection

The data collection instrument used was a questionnaire which was administrated to a total sample of 200 managers are classified by job title and respondents are also classified by their job functions are corporate executive, purchasing, manufacturing/production, distribution/logistic, SCM, transportation, material, and operation from consumer goods firms in Johor Bahru areas.

### 4. Reliability Analysis

The Cronbach's alpha was conducted to assess the reliability of each scale. Alpha values over 0.7 indicate that all scales can be considered reliable (Nunally, 1978). For each of the item scales, factor analysis was used to reduce the total number of items to manageable factor. Principal components analysis is used to extract factors with eigenvalue greater than 1. Varimax rotation is used to facilitate interpretation of the factor matrix. Sampling adequacy measurement tests are also examined via the Kaiser-Meyer-Olkin statistics to validate use of factor analysis.

Table 1 shows the results from factors analysis. The KMO value of 0.842 indicate sampling adequacy. The factor model indicates three distinct factors loading without any misclassification: strategic supplier relationship, customer relationship and information sharing. Cronbach's alphas among 18 items in the questionnaires exceeded 0.7. Six items are identified for strategic supplier partnership (SSP), five items are identified for customer relationship (CR), and seven items for information sharing (IS) respectively. These items are treated as independent factors.

**Table 1: Summary for factor analysis of SSP, CR, and IS**

	SSP	CR	IS
We consider quality as our number one criterion in selecting suppliers	0.52		
We regularly solve problems jointly with our suppliers	0.43		
We have helped our suppliers to improve their product quality	0.74		
We have continuous improvement programs that include our key suppliers	0.45		
We include our key suppliers in our planning and goal- setting activities	0.73		
We actively involve our key suppliers in new product development processes	0.52		
We frequently interact with customers to set reliability responsiveness, and other standards for us		0.576	
We frequently measure and evaluate customer satisfaction		0.647	
We frequently determine future customer expectations		0.570	
We facilitate customers' ability to seek assistance from us		0.525	
Evaluate the importance of our relationship with our customers		0.701	
We inform trading partners in advance of changing needs			0.741
Our trading partners share proprietary information with us			0.709
Keep us fully informed about issues that affect our business			0.712
Share business knowledge of core business processes with us			0.653
Share business knowledge of core business processes with us			0.735
Exchange information that helps establishment of business planning			0.586
Informed about events or changes that may affect the other partner			0.345
Cronbach's alpha	0.76	0.73	0.85
KMO (Kaiser-Meyer-Olkin) value	0.842		

A similar factor analysis was applied to the operation system responsiveness (OSR), logistic process responsiveness (LPR), supplier network responsiveness (SNR) and competitive advantage of the firm (CA). Among 40 items in the questionnaire, nine items are deleted during the factor analysis. A total of 31 items were reduced to four underlying factors loadings, depicted in Table 2. Cronbach’s alphas among 31 items in the questionnaires are exceeded 0.7. Six items are identified for operation system responsiveness (OSR), five items for logistic process responsiveness LPR), six items for supplier network responsiveness (SNR), and fourteen items for competitive advantage of the firm (CA), respectively. These items are treated as dependent factors. The KMO value of 0.784 indicate sampling adequacy.

**Table 2: Summary for factor analysis of OSR, LOR, SNR and CA**

Items	OSR	LPR	SNR	CA
Responds rapidly to changes in product volume demanded by customers	0.562			
Responds rapidly to changes in product mix demanded by customers	0.653			
Effectively expedites emergency customer orders	0.644			
Rapidly reconfigures equipment to address demand changes	0.754			
Rapidly changes manufacturing processes to address demand changes	0.755			
Rapidly adjusts capacity to address demand changes	0.620			
Responds rapidly to unexpected demand change		0.456		
Rapidly adjusts warehouse capacity to address demand changes		0.654		
Rapidly varies transportation carriers to address demand changes		0.543		
Rapidly accommodates special or non-routine customer requests		0.654		
Effectively delivers expedited shipments		0.655		
Major suppliers change product volume in a relatively short time			0.540	
Major suppliers change product mix in a relatively short time			0.432	
Major suppliers consistently accommodate our requests			0.654	
Major suppliers have outstanding on-time delivery record with us			0.734	
Major suppliers effectively expedite our emergency orders			0.765	
Major suppliers provide quick inbound logistics to us			0.541	
We offer competitive prices				0.454
Offer prices as low or lower than our competitors				0.543
Compete based on quality				0.544
Offer products that are highly reliable				0.654
Offer products that are very durable				0.456
Offer high quality products to our customers				0.454
Deliver customer orders on time				0.655
Provide dependable delivery				0.765
Provide customized products				0.567
Alter our product offerings to meet client needs				0.456
Cater to customer needs for “new” features				0.654
We are first in the market in introducing new products				0.562
We have time-to-market lower than industry average				0.652
We have fast product development				0.465
Cronbach’s alpha	0.84	0.82	0.85	0.86
KMO (Kaiser-Meyer-Olkin) value	0.777			

**5. Correlation Analysis**

Table 3 shows the correlation between independent variables (supplier strategic partnership, customer relationship, and information sharing) and dependent variables (supply chain responsiveness and competitive advantage of the firm) were positive. Strategic supplier partnership had a correlation of 0.353, p<0.01 with operation system responsiveness, 0.437, p<0.01 logistic process responsiveness, 0.422, p<0.01 supplier network responsiveness, 0.441, p<0.01 competitive advantage. Which mean that the respondents are more likely to evaluate strategic supplier partnership was positive when supply chain responsiveness and competitive advantage are positive. Customer relationship had a correlation of 0.242, p<0.05 with operation system responsiveness, 0.737, p<0.1 logistic process responsiveness, 0.425, p<0.05 supplier network responsiveness, 0.423, p<0.01 competitive advantage, 0.280. Information sharing has a correlation of 0.394, p<0.01 with operation system responsiveness, 0.466, p<0.01 logistic process responsiveness, 0.420, p<0.01 supplier network responsiveness, 0.392, p<0.01 competitive advantage.

**Table 3: The correlation between independent and dependent variables**

		1	2	3	4	5	6	7
Strategic supplier partnership	Pearson Correlation	1.000						
	Sig. (2-tailed)							
	N	200						
Customer relationship	Pearson Correlation	0.398**	1.000					
	Sig. (2-tailed)	0.002	.					
	N	200	200					
Information sharing	Pearson Correlation	0.506**	0.302**	1.000				
	Sig. (2-tailed)	0.000	0.001	.				
	N	200	200	200				
Operation system responsiveness	Pearson Correlation	0.353**	0.242*	0.394**	1.000			
	Sig. (2-tailed)	0.000	0.026	0.000	.			
	N	200	200	200	200			
Logistic process responsiveness	Pearson Correlation	0.437**	0.337*	0.466**	0.689**	1.000		
	Sig. (2-tailed)	0.000	0.031	0.000	0.000	.		
	N	200	200	200	200	200		
Supplier network responsiveness	Pearson Correlation	0.422**	0.425*	0.420**	0.528**	0.665**	1.000	
	Sig. (2-tailed)	0.000	0.049	0.000	0.000	0.000	.	
	N	200	200	200	200	200	200	
Competitive advantage	Pearson Correlation	0.441**	0.423**	0.392**	0.667**	0.659**	0.531**	1.000
	Sig. (2-tailed)	0.000	0.000	0.049	0.000	0.000	0.000	.
	N	200	200	200	200	200	200	200

\*p value <0.05, \*\*p value <0.01

## 6. Regression Analysis

The parameters of this model are estimated using multivariate regression analysis. Table 4 shows the regression between all independent variables (strategic supplier partnership, customer relationship, and information sharing) to examine the relationship to operation system responsiveness (OSR), logistic process responsiveness (LPR) and supplier network responsiveness (SNR). Table 4 also shows coefficients of each model along with corresponding test statistics. In Model 1 where the dependent variable is overall supply chain responsiveness (SCR), the model seem to be reliable (p-value for  $F < 0.01$  and adjusted R-square of 0.320. Model 2, dependent variable is operation system responsiveness (OSR). The model seem to be reliable (p-value for  $F < 0.01$ . information sharing is the most important determinant in operation system responsiveness with p-value for  $t < 0.01$ , followed by strategic supplier partnership with p-value of  $t < 0.05$ , while customer relationship is significant with p-value of  $t < 0.05$ . Model 3, dependent variable is logistic process responsiveness (LPR). The model seem to be reliable (p-value for  $F < 0.01$ ). Once again, information sharing is the most important determinant in logistic process responsiveness (LPR) with p-value for  $t < 0.01$ , followed by strategic supplier partnership with p-value of  $t < 0.05$ , while customer relationship is significant with p-value of  $t < 0.05$ . Model 4, dependent variable is Supplier network responsiveness (SNR). The model seem to be reliable (p-value for  $F < 0.01$ ). It appears, strategic supplier partnership is the most important determinant in supplier network responsiveness with p-value of  $t < 0.01$ , followed by information sharing with p-value of  $t < 0.05$ , while customer relationship is significant with p-value of  $t < 0.05$ . Results in model 1,2,3,4 appear to confirm  $H_1, H_{1a}, H_{1b}, H_{1c}$ .

**Table 4: Model parameter estimates of supply chain responsiveness (t- Value in parenthesis)**

	Model 1 Dependent variable = overall SCR	Model 2 Dependent variable = OSR	Model 3 Dependent variable = LPR	Model 4 Dependent variable = SNR
Constant	116.211 (7.422)**	22.099 (7.095)**	16.214 (5.812)**	18.194 (6.481)**
Strategic supplier partnership	0.949 (2.066)*	0.206 (2.257)*	0.172 (2.101)*	0.180 (2.185)*
Customer relationship	1.021 (1.989)*	0.109 (1.072)*	0.107 (1.172)*	0.110 (1.193)*
Information Sharing	1.524 (3.513)**	0.277 (3.208)**	0.224 (2.901)**	0.163 (2.095)*
Adj R2	0.320	0.299	0.285	0.163
F-value	12.253**	10.000**	8.643**	6.529**

\*p value <0.05, \*\*p value <0.01

Table 5 shows the regression of supply chain management practices in term of strategic supplier partnership, customer relationship and information sharing and its relationship with competitive advantage in term of price, quality, delivery dependability, time to market, and product innovation.

In Model 5 where the dependent variable is overall competitive advantage (CA), the model seem to be reliable (p-value for  $F < 0.01$  and adjusted R-square of 0.422. information sharing is the most important determinant in overall competitive advantage with p-value for  $t < 0.01$ , followed by customer relationship with p-value of  $t < 0.05$ , while strategic supplier partnership is significant with p-value of  $t < 0.05$ .

Model 6, dependent variable is price (P). The model seem to be reliable (p-value for  $F < 0.01$ . information sharing is the most important determinant in price with p-value for  $t < 0.01$ , followed by strategic supplier partnership and customer relationship with similar p-value of  $t < 0.05$ .

Model 7, dependent variable is quality (Q). The model also seem to be reliable (p-value for  $F < 0.01$ ). Once again, information sharing is the most important determinant in quality (Q) with p-value for  $t < 0.01$ , followed by strategic supplier partnership with p-value of  $t < 0.05$ , while customer relationship is significant with p-value of  $t < 0.05$

Model 8, dependent variable is delivery dependability (DD). The model also seem to be reliable (p-value for  $F < 0.01$ ). Strategic supplier partnership, customer relationship and information sharing have similar effect on delivery dependability with p-value of  $t < 0.05$ .

Model 9, dependent variable is time to market (TT). The model also seem to be reliable (p-value for  $F < 0.01$ ). Customer relationship and information sharing have similar effect on time to market with p-value for  $t < 0.01$ , followed by strategic supplier partnership with p-value of  $t < 0.05$ .

Model 10, dependent variable is product innovation (PI). The model also seem to be reliable (p-value for  $F < 0.01$ ). Strategic supplier partnership, customer relationship and information sharing have similar effect on product innovation with p-value of  $t < 0.05$ . Results in model 5,6,7,8,9,10 appear to confirm  $H_2, H_{2a}, H_{2b}, H_{2c}$ .

**Table 5: Model parameter estimates of competitive advantage (t- Value in parenthesis)**

	Model 5 Dependent variable = overall CA	Model 6 Dependent variable = Price (P)	Model 7 Dependent variable = Quality (Q)	Model 8 Dependent variable = Delivery dependability (DD)	Model 9 Dependent variable = Time to Market (TM)	Model 10 Dependent variable = Product innovation (PI)
Constant	126.311 (8.522)**	25.079 (8.094)**	17.314 (6.712)**	18.293 (6.571)**	20.195 (7.279)**	19.184 (7.582)**
Strategic supplier partnership	0.847 (2.056)*	0.102 (2.356)*	0.152 (2.521)*	0.187 (2.984)*	0.161 (1.806)*	0.180 (2.285)*
Customer relationship	1.322 (1.789)*	0.127 (1.172)*	0.105 (1.283)*	0.132 (1.392)*	0.278 (2.833)**	0.110 (1.393)*
Information Sharing	1.924 (4.543)**	0.267 (3.298)**	0.325 (2.955)**	0.163 (2.095)*	0.288 (3.267)**	0.163 (2.065)*
Adj R2	0.422	0.399	0.483	0.261	0.353	0.263
F-value	14.453**	10.222**	9.743**	6.542**	12.529**	7.525**

\*p value  $< 0.05$ , \*\*p value  $< 0.01$

The specifics of each hypothesis testing result can be summarized in Table 6

**Table 6: Summary Result of Hypotheses Testing**

Hypotheses	Description	Results
H1	Supply chain management practices are positively related to supply chain responsiveness	Accepted
H1a	Strategic supplier partnership is positively related to supply chain responsiveness	Accepted
H1b	Customer relationship is positively related to supply chain responsiveness	Accepted
H1c	Information sharing is positively related to supply chain responsiveness	Accepted
H2	Supply chain management practices are positively related to competitive advantage	Accepted
H2a	Strategic supplier partnership is positively related to competitive advantage	Accepted
H2b	Customer relationship is positively related to competitive advantage	Accepted
H2c	Information sharing is positively related to competitive advantage	Accepted



## 7. Results

In this study, the following outcomes were obtained: The correlation analysis showed that supply chain management practices in terms of strategic supplier partnership, customer relationship and information sharing are related to supply chain responsiveness in terms of operation system responsiveness, logistic process responsiveness and supplier network responsiveness. Supply chain management practices also related to competitive advantage of the firm in terms of price, quality, delivery dependability, time to market and product innovation. For hypothesis 1a, this study found a significant relationship between strategic supplier partnership and operation system responsiveness, logistic process responsiveness and supplier network responsiveness. While hypothesis 1b assessed the relationship between customer relationship and operation system responsiveness, logistic process responsiveness and supplier network responsiveness, findings show there is significant relationship. Hypothesis 1c, considered the relationship between information sharing and operation system responsiveness, logistic process responsiveness and supplier network responsiveness and testing found that there is a significant relationship.

According to the result shown information sharing was the determinant affect of supply chain responsiveness, followed by customer relationship and strategic supplier partnership respectively. The researcher found that information sharing has strong determinant on supply chain responsiveness than customer relationship and strategic supplier partnership. Therefore, the better information sharing, the better supply chain responsiveness was. From these findings, managers should improve information sharing effectively, so that supply chain responsiveness can be increased and generate the firm performance.

For hypothesis 2a, this study found a significant relationship between strategic supplier partnership and price, quality, delivery dependability, time to market and product innovation. While hypothesis 2b assessed the relationship between customer relationship and price, quality, delivery dependability, time to market and product innovation, findings show there is significant relationship. Hypothesis 2c, considered the relationship between information sharing price, quality, delivery dependability, time to market and product innovation and testing found that there is a significant relationship.

According to the result also shown information sharing was the determinant affect of competitive advantage of the firm, followed by customer relationship and strategic supplier partnership respectively. The researcher found that information sharing has strong determinant on competitive advantage than customer relationship and strategic supplier partnership. Therefore, the better information sharing, the better competitive advantage was. Based on these findings, managers should improve information sharing effectively, so that supply chain competitive advantage can be increased and generate the firm performance.

## 7. Discussion

The aim of the research presented in this research was to add to the knowledge on supply chain management practices by exploring the relationship between strategic supplier partnership, customer relationship, information sharing and supply chain responsiveness. By developing and testing a research framework of supply chain management practices and supply chain responsiveness constructs and conducting an analysis a number of consumer goods firm with valid and reliable instrument, this study represented one of the investigate the relationship between strategic supplier partnership - supply chain responsiveness, customer relationship-supply chain responsiveness and information sharing – supply chain responsiveness. This study also investigated the relationship between supply chain management practices and competitive advantage of the firm.

Overall, this study contributes to the knowledge of the role of supply chain management practices, supply chain responsiveness and competitive advantage of the firm in supply chain management field. *First*, it proposed a theoretical supply chain management practices framework that identified strategic supplier partnership, customer relationship and information sharing and competitive advantage of the firm. *Second*, this study provides a practical and useful tool for supply chain managers to audit and assess supply chain management practices. *Third*, this study provides conceptual and prescriptive literature regarding supply chain management practices, supply chain responsiveness and competitive advantage of the firm. *Fourth*, the results lend support to the claim that better of supply chain management practices lead to better of supply chain responsiveness and competitive advantage of the firm. Managers seeking improved supply chain responsiveness and competitive advantage through supply chain management practice. The findings of this research have several important implications for practitioners.

First, as today's business competition is moving from among organizations to between supply chains partners, organizations are increasingly adopting supply chain management practices, in the hope for generating supply chain responsiveness and competitive advantage of the firm. Research finding showed that 47% of the respondents indicated that their firm has not embarked upon a program aimed specially at implementing supply chain management. Of the remaining 53% of the respondents indicated that their firm has embarked on a supply chain management program for just two years or less. The findings of this research assure the practitioners that SCM is an effective way of competing, and the implementation of SCM practices does have a strong impact on supply chain responsiveness and competitive advantage of the firm.

Second, in today's fast paced global competition, organizations are in need of greater responsiveness, so as to rapidly meet customer needs. Moreover, responsiveness on all dimensions, namely, supply side, within the organization, and downstream is needed for total responsiveness of the firm. Supply chain responsiveness has been poorly defined and there is a high degree of variability (ranging from flexibility to agility) in people's mind about its meaning. The findings demonstrate to the practitioners the vital components of responsiveness, and ways of achieving them.

Third, the study provides organizations a set of valid and reliable measurements for evaluating, benchmarking, and comparing supply chain responsiveness at different nodes within the supply chain (i.e. raw material supplier, component supplier, assembler, sub-assembler, manufacturer, distributor, wholesaler, and retailer). The measurements developed in this research can capture the different aspects of supply chain responsiveness, thus not only enabling use by practitioners to identify the immediate outcomes of it, but also to understand its impacts on organizational performance.

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