

Firm's Competitiveness through Supply Chain Responsiveness and Supply Chain Management Practices in Nigeria.

Somuyiwa, Adebambo. O.Ph.D

Department of Transport Management, Ladoke Akintola University of Technology, P.M.B. 4000, Ogbomoso, Oyo State, Nigeria.

Mcilt, Mcisn

Department of Transport Management, Ladoke Akintola University of Technology, P.M.B. 4000, Ogbomoso, Oyo State, Nigeria.

Adebayo, Toyin, I

Department of Transport Management, Ladoke Akintola University of Technology, P.M.B. 4000, Ogbomoso, Oyo State, Nigeria.

e-mail: iseoluwa89@yahoo.com

Abstract

Supply Chain Management (SCM) is management of material, money, men, and information within and across the supply chain to maximize customer satisfaction and to enhance competitive advantage. However, the characterization of the current business practices by variation in demands and differences in customer requirements has motivated many firms to be responsive. In the light of this, the paper examines how these firms respond to these changes so as to sustain and further create competitive advantages. One hundred and fifteen (115) manufacturing companies, basically medium/large companies formed the sample of the study and data was analyzed using multiple regression analysis. The result revealed positive association between Supply Chain Responsiveness (SCR), SCM practices and Competitive Advantage. Finally, the study provides suitable recommendation on the scope for improvement based on current levels of various predominant SCM practices and SCR criteria that directly impact competitive advantage of a firm, so as to make the organizations more competitive.

Key words: Supply Chain Practices, Responsiveness, Competitive Advantage, Information Sharing.

1.0 Introduction

Supply chain management has been defined as the systemic, strategic coordination of the traditional business functions and tactics across these business functions within a particular organization and across businesses within the supply chain for the purposes of improving the long-term performance of the individual organizations and the supply chain as a whole (CLM 2000). However, the characterization of the current business practices by variation in demands and differences in customer requirements has motivated many firms to be responsive (Somuyiwa et al.). Therefore, the modern supply chains are expected to respond rapidly, effectively, and efficiently to changes in the marketplace so as to sustain, and furthermore create competitive advantage.

Further, as the new competitive environment changes to more global, technologically oriented and customer driven, as product life cycles shrink and new products get introduced rapidly, as customers continually demand higher quality, faster response, and greater reliability of products and services (D' Souza, 2002), the new world market demands a more customer responsive behaviour by companies and firms have responded with innovative products and improved manufacturing processes to manufacture products.

Therefore, this paper focuses on studying the effect of supply chain responsiveness on competitive advantage of firms in Nigeria through the implementation of a set of SCM practices by such firms. The three sets of hypotheses formulated for the study are:

H1: That a firm's supply chain management practices is not positively related to supply chain responsiveness.

H2: That supply chain responsiveness is not positively related to the competitive advantages of a firm.

H3: That firm's supply chain management practice is not positively related to the Competitive advantages of a firm.

2.0 Literature Review

2.1. Overview of Supply Chain Management (SCM) and Competitiveness

A supply chain is a network of organizations performing various processes and activities to produce value in the form of products and services for the end customer (Christopher, 1992).

According to Li, Ragu-Nathan, Ragu-Nathan and Rao (2006) the dual purpose of SCM is to improve the performance of an individual organization as well as that of the entire supply chain. Bowersox and Closs (1996) argued that to be fully effective in today's competitive environment, firms must expand their integrated behaviour to incorporate customers and suppliers. This extension of integrated behaviours, through external integration, is referred to by Bowersox and Closs (1996) as supply chain management. Thus SCM integrates both information flow and the flow of goods seamlessly between trading partners as an effective competitive weapon (Childhouse & Towill, 2003; Feldmann & Muller, 2003). The main reason and objective of SCM is to provide a strategic weapon to build up and enhance sustainable competitive advantage by cost reduction without compromising customer satisfaction (Mentzer et al., 2001).

2.2 SCM Practices

'SCM practices' is defined as "the set of activities undertaken by an organization to promote effective management of its supply chain" (Li et al.). Li et al. identified strategic supplier partnership, customer relationship, and information sharing as key SCM practices.

Strategic supplier partnership is defined as “the long term relationship between the organization and its suppliers. It is designed to leverage the strategic and operational capabilities of individual participating organizations to help them achieve significant ongoing benefits” (Li et al.). Some of the advantages of including suppliers early in the product-design process as mentioned by Tan, Lyman and Wisner (2002) are that suppliers can offer cost effective design alternatives, assist in selecting better components and technologies, and aid in design assessment. Long-term relationship does not refer to any specific period of time, but rather, to the intention that the arrangement is not going to be temporary (Chen & Paulraj, 2004). Through close relationships supply chain partners are willing to (1) share risks and reward and (2) maintain the relationship on a long term basis (Landeros & Monczka, 1989; Cooper & Ellram, 1993; Stuart, 1993).

Customer relationship is defined as “the entire array of practices that are employed for the purpose of managing customer complaints, building long-term relationships with customers, and improving customer satisfaction” (Li et al.). Successful SCM involves 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). Close customer relationship allows product differentiation from competitors, helps sustain customer loyalty, and elevates the value provided to customers (Magretta, 1998). Immediate customer relationship activities have played a crucial role in developing effective SCM strategies (Wisner, 2003).

Information sharing refers to “the extent to which critical and proprietary information is communicated to one’s supply chain partner” (Li et al.). Simatupang and Sridharan (2005) bring forth some of the elements that comprise information sharing, including data acquisition, processing, storage, presentation, retrieval, and broadcasting of demand and forecast data, inventory status and locations, order status, cost-related data, and performance status. However, there is the reluctance on the part of organizations in the supply chain to share information with each other. Information is generally viewed as providing an advantage over competitors, and organizations resist sharing with their partners (Vokurka & Lummus, 2000) due to the fear of giving away competitive and sensitive information such as inventory levels, production schedules (Lancioni, Smith & Oliva, 2000; Ballou, Gillbert & Mukherjee, 2000; Croom, Romano & Giannakis, 2000).

2.3. Supply Chain Responsiveness

Supply chain responsiveness is defined as the capability of promptness and the degree to which the supply chain can address changes in customer demand (Holweg, 2005; Prater, Biehl & Smith., 2001; Lummus, Duclos & Vokurka, 2003; Duclos, Vokurka & Lummus 2003). Prater et al. further maintain that as the level of speed and more importantly flexibility increase, the level of supply chain responsiveness increases. Aquilano, Chase and Davis (1995) contend that “low cost, high quality and improved responsiveness (both delivery time and flexibility of product delivery)” are the three main strategic imperatives to stay competitive in this century. Bowersox, Closs and Stank (1999) advocate the need for organizations to be responsive when the penalties associated with uncertainty are higher. These penalties for an organization could include costs of stocking out or carrying the wrong inventory and which can be mitigated through a responsive system, by adopting effective SCM practices. The construct of supply chain responsiveness identified are:

- **Operations system responsiveness** is defined as the ability of a firm’s manufacturing system to address changes in customer demand. Duclos et al. and Lummus et al. in a conceptual study, emphasize that operation responsiveness at each node of the chain is an integral component of supply chain responsiveness. They further argue that in order to

meet the end customer's needs, each entity in the supply chain must deliver the product or service in a timely and reliable manner.

- **Logistics process responsiveness** is defined as the ability of a firm's outbound transportation, distribution, and warehousing system (including 3PL/4PL) to address changes in customer demand. The responsiveness in the logistic processes is a vital component in the success of a responsive supply chain strategy (Fawcett, 1992).
- **Supplier network responsiveness** is defined as the ability of a firm's major suppliers to address changes in the firm's demand. A key to responsiveness is the presence of responsive and flexible partner upstream and downstream of the focal firm (Christopher & Peck, 2004). The ability of firms to react quickly to customer demand is dependent on the reaction time of suppliers to make volume changes. Whenever disruptive causes such new technology, terrorist threats (Walker, 2005) or cut-throat competition tend to throw the supply chain haywire, the supply chain networks must be ready to react to any ripple effect. Slack (1991) argues that supplier networks are the essential building blocks of a flexible system.

2.4 Competitive Advantage

Competitive advantage is defined as the "capability of an organization to create a defensible position over its competitors" (Li et al.). Tracey, Vonderembse and Lim (1999) argues that competitive advantage comprises of distinctive competencies that sets an organization apart from competitors, thus giving them an edge in the marketplace. They further add that it is an outcome of critical management decisions.

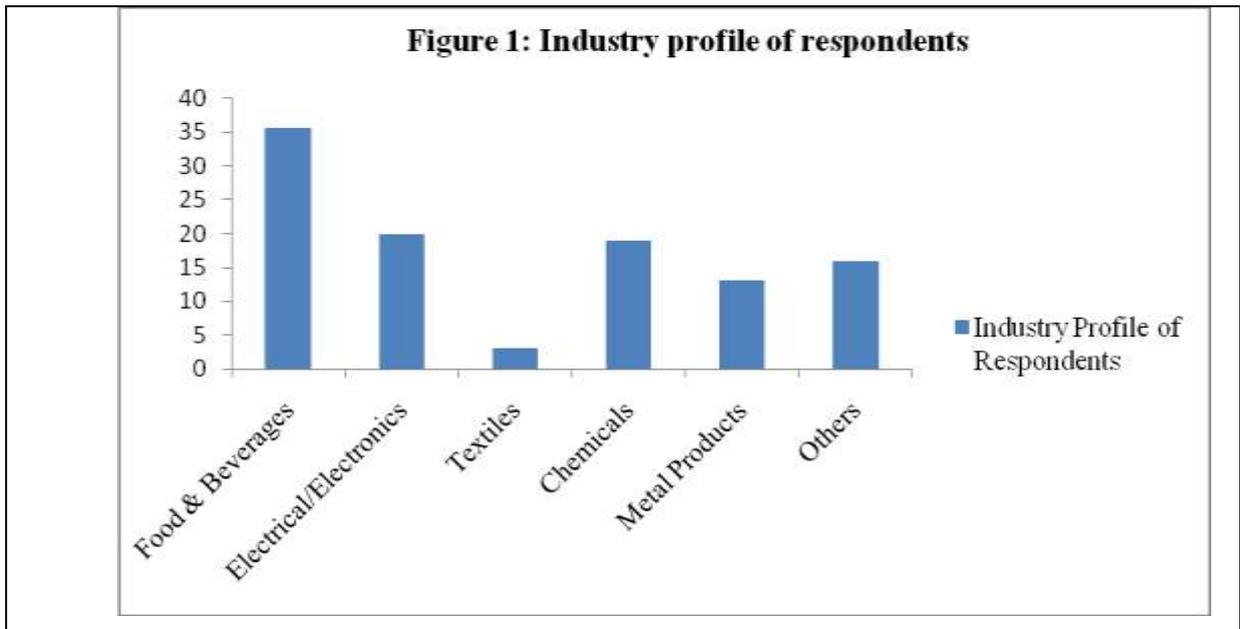
Today, however, competition is considered a "war of movement" that depends on anticipating and quickly responding to changing market needs (Stalk, Evans & Shulman, 1992). Competitive advantage emerges from the creation of superior competencies that are leveraged to create customer value and achieve cost and/or differentiation advantages, resulting in market share and profitability performance (Barney, 1991; Coyne, 1986; Day & Wensley, 1988; Prahalad & Hamel, 1990). Sustaining competitive advantage requires that firms set up barriers that make imitation difficult through continual investment to improve the advantage, making this a long-run cyclical process (Day & Wensley, 1988). Most managers agree that cost and quality will continue to remain the competitive advantage dimensions of a firm (D' Souza & Williams, 2000). The five dimensions of competitive advantage construct used in this study are:

- i. Price/Cost. "The ability of an organization to compete against major competitors based on low price".
- ii. Quality. "The ability of an organization to offer product quality and performance that creates higher value for customers".
- iii. Deliver dependability. "The ability of an organization to provide on time the type and volume of product required by customer(s)".
- iv. Product Innovation. "The ability of an organization to introduce new products and features in the market place".
- v. Time to Market. "The ability of an organization to introduce new products faster than major competitors".

3.0 Methodology

The study was carried out in Nigeria and was conducted on a total of 115 manufacturing firms that are spread across Nigeria. The target respondents for this study were the manufacturing/purchasing/operations/logistics managers since the paper has a supply chain management focus and these personnel were deemed to have the best knowledge on

supply chain issues. The three hypotheses formulated for the study were tested using multiple regression analysis.



Source: Field Survey (2012).

4.0 Results and Discussion

H1: That a firm's supply chain management practices is not positively related to supply chain responsiveness.

Table 1: Model summary of regression SCMP on of supply chain responsiveness

Model	R	R ²	Adjusted R ²	Std. Error of Estimate	F value	Sig.
1	.534 ^a	.285	.277	2.321	15.703	.000 ^a

a. Predictors: (constant), Strategic supplier relationship (SSR), Customer relationship (CR), Information Sharing (IS)

b. Dependent variable: Supply chain responsiveness (SCR)

Source: Field Survey (2012).

As shown in Table 1, R Square value is 0.277. This means that the research model explains 28.5 percent of the variance in supply chain responsiveness and the model reaches statistical significance (Sig. = .000, and $p \leq .01$).

Table 2: Coefficient of Regression of Supply chain responsiveness

Model		Unstandardized	Standardized	t	Sig
		Coefficients	Coefficients		
		B	Std error	Beta	
1	constant	.281	1.260		.824
		.866	.270	.328	.001
		.551	.259	.234	.027
		.041	.239	.017	.864
Dependent variable: SCR					

Source: Field Survey (2012).

Hypothesis 1 was tested by regressing SCR on the SCMP. Results suggest that the higher the level of SCM practices, the higher the supply chain responsiveness ($\beta = 0.328$, $t = 3.281$, $p \leq .01$), therefore hypothesis 1 was supported. In other words 'SCM practices' of a firm has a direct positive influence on supply chain responsiveness. This finding is supported by Yusuf, Adeleye and Sivayoganathan (2003) study, which shows high correlation between the supplier partnership practices and responsiveness. However, information sharing was found to have a very low contribution with $\beta = 0.017$.

H2: That supply chain responsiveness is not positively related to the competitive advantages of a firm.

Table 3: Model summary of regression of SCR on competitive advantage

Model	R	R ²	Adjusted R ²	Std. Error of Estimate	F value	Sig.
1	.448 ^a	.201	.198	1.020	9.482	.000 ^a

Predictors: (constant), Operations system responsiveness (OSR), Logistics process Responsiveness (LPR), Supplier Network Responsiveness (SNR)

Source: Field Survey (2012).

Firm's Competitive Advantage (CA) was regressed on SCR to test empirically hypothesis 2. According to Table 3 the model explains 20 per cent of the variance in competitive advantage with a statistical significance (Sig. = .000, and $p \leq .01$).

Table 4: Coefficient of Regression of Supply chain responsiveness

Model		Unstandardized	Standardized		t	Sig
		Coefficients	Coefficients			
		B	Std error	Beta		
1	Constant	.993	.553		1.797	.075
		.214	.119	.203	1.803	.074
		.119	.114	.116	1.048	.297
		.245	.105	.222	2.337	.021
Dependent variable: CA						

Source: Field Survey (2012).

Table 4 shows that the main effects of OSR ($\beta = 0.203$, $t = 1.803$, $p \geq .05$) and LSR ($\beta = 0.116$, $t = 1.048$, $p \geq .05$) were insignificant. However, the main effect of SNR is significant ($\beta = 0.222$, $t = 2.337$, $p \leq .05$), thus, hypothesis 2 was supported.

H3: That firm's supply chain management practice is not positively related to the competitive advantages of a firm.

Table 5: Model summary of regression of SCMP on CA

Model	R	R ²	Adjusted R ²	Std. Error of Estimate	F value	Sig.
1	.406 ^a	.165	.162	2.129	15.402	.000 ^a

Predictors: (constant), SSR, CR

Source: Field Survey (2012).

Table 6: Coefficient of Regression of CA

Model		Unstandardized	Standardized		t	Sig
		Coefficients	Coefficients			
		B	Std error	Beta		
1	Constant	.993	.553		1.797	.000
		.127	.114	.203	3.115	.000
		.169	.126	.314	4.703	.000
Dependent variable: CA						

Source: Field Survey (2012).

Hypothesis H3 was also found to be significant and thus supported. This indicates that the higher the level of SCM practices by a firm, the higher the level of its competitive advantage. In other words 'SCM practices' of a firm has a direct positive influence on its competitive advantage. This result is in line with the work of Li et al., (2005), that by adopting effective SCM practices firms can gain greater competitive advantage. While customer relationship contribute largely ($\beta = 0.314$, $t = 4.703$, $p \leq .01$) to CA. However, from

these results it is clear that information sharing (IS) does not contribute significantly to the prediction of CA. One can argue that even though information sharing is found to be non instrumental in the prediction of CA, having close customer and supplier relations includes collaborating and assisting one another with vital, on time, and quality information.

5.0. Conclusion and Recommendation

This paper has investigated the impact of SCR and SCM practices in gaining competitive advantage. Since, organizations have multiple objectives like enhanced competitiveness, better customer service and increased profitability and so on they seek these objectives by employing various business performance improvement approaches. Not surprisingly, information technology sits at the heart of this advance. Specific technologies may vary from company to company, but the underlying principles remain the same: to create seamless pipeline where product is handled minimally but moves at maximum velocity. The results is a supply chain that can be managed according to approach where the customer order is a starting point, and works down the rest of the chain are such to eliminating waste and trimming processes that do not add value along on the way. Therefore, it is recommended that organizations establish mutual trust within supply chain to share the vital information for effective SCM practice.

References

- Aquilano, N. J., Chase, R. B., & Davis, M. M. (1995). *Fundamentals of operations management*, Chicago, IL: Irwin.
- Ballou, R. H., Gillbert, S. M., & Mukherjee, A. (2000). New managerial challenge from supply chain opportunities. *Industrial Marketing Management*, 29, 7-18.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Bowersox, D. J., & Closs, D. J. (1996). *Logistical management: The integrated supply chain process*, McGraw-Hill.
- Bowersox, D. J., Closs, D. J., & Stank, T. P. (1999). 21st Century logistics: Making supply chain integration a reality, The Council of Logistics Management, Oak Brook, IL.
- Chen, I. J., & Paulraj, A. (2004). Understanding supply chain management: Critical research and a theoretical framework. *International Journal of Production Research*, 42(1), 131 - 163.
- Childhouse, P., and Towill, D. R. (2003). Simplified material flow holds the key to supply chain integration. *OMEGA*, 31(1), 17-27.
- Christopher, M., & Peck, H. (2004). Building the resilient supply chain, *International Journal of Logistics Management*, 15(2), 1-13.
- Christopher, M. G. (1992). *Logistics and supply chain management*. London, UK: Pitman Publishing.
- CLM, (2000). *What it's all about*. Oak Brook, IL: Council of Logistics Management.
- Cooper, M. C., & Ellram, L. M. (1993). Characteristics of supply chain management and the implications for purchasing and logistics strategy. *International Journal of Logistics Management*, 4, 13-24.
- Croom, S., Romano, P., & Giannakis, M. (2000). Supply chain management: An analytical framework for critical literature review. *European Journal of Purchasing and Supply Management*, 6(1), 67-83.
- Coyne, K. P. (1986). Sustainable competitive advantage - What it is, What it isn't. *Business Horizons*, 29(1), 54-61.
- D' Souza, D. E., & Williams, F. P. (2000). Toward a taxonomy of manufacturing flexibility Dimensions. *Journal of Operations Management*, 18(5), 577-593.
- D'Souza, D. E. (2002). Toward an understanding of how organizations create manufacturing Flexibility. *Journal of Managerial Issues*, 14(4), 470-486.
- Day, G. S., & Wensley, R. (1988). Assessing advantage: A framework for diagnosing competitive superiority. *Journal of Marketing*, 52(2), 1-20.

- Duclos, L. K., Vokurka, R. J., & Lummus, R. R. (2003). A conceptual model of supply Chain Flexibility. *Industrial Management & Data Systems*, 103(6), 446-456.
- Fawcett, S. E. (1992). Strategic logistics in coordinated global manufacturing success. *International Journal of Production Research*, 30(5), 1081-2000.
- Feldmann, M. & Muller, S. (2003). An incentive scheme for true information providing in supply chains. *OMEGA*, 31(2), 63-73.
- Holweg, M. (2005). An investigation into supplier responsiveness. *International Journal of Logistics Management*, 16(1), 96-119.
- Lancioni, R. A., Smith, M. F., & Oliva, T. A. (2000). The role of the internet in supply chain Management. *Industrial Marketing Management*, 29, 45-56.
- Landeros, R., & Monczka, R. M. (1989). Cooperative buyer/seller relationships and a firm's Competitive Posture. *Journal of Purchasing and Materials Management*, Fall, 9-18.
- Lee, H. L. (2004). The triple-A supply chain. *Harvard Business Review*, 82(10), 102-112.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107-124.
- Lummus, R. R., Duclos, L. K., & Vokurka, R. J. (2003). Supply chain flexibility: Building a new model. *Global Journal of Flexible Systems Management*, 4(4), 1-13.
- Magretta, J. (1998). The power of virtual integration: An interview with dell computers' Michael Dell. *Harvard Business Review*, 76(2), 72-84.
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Soonhoong M., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business Logistics*, 22(2), 1-25.
- Prahalad, C. K. & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79-92.
- Prater, E., Biehl, M., & Smith, M. A. (2001). International supply chain agility. *International Journal of Operations & Production Management*, 21(5/6), 823-840.
- Rajendra, K. S., Dixit, G. & Ashish, A. (2011). Understanding of supply chain: A literature Review. *International Journal of Engineering Science and Technology (IJEST)* 3(3), 2059-2072.
- Simatupang, T. M., & Sridharan, R. (2005). An integrative framework for supply chain Collaboration. *International Journal of Logistics Management*, 16(2), 257- 274.

- Slack, N. (1991). *The manufacturing advantage*. London: Mercury Books.
- Somuyiwa, A. O., Adebayo, I. T., & Akanbi, T. A. (2011). Supply chain performance: An agile supply chain driven by information system (is) capabilities. *British Journal of Arts and Social Sciences* 1(2), 125-135.
- Stalk, G., & Hout, T. (1990). *Competing against time*. New York, NY: The Free Press.
- Stalk, G., Evans, P. & Shulman, L. E. (1992). Competing on capabilities: The new rules of corporate strategy. *Harvard Business Review*, 70(2), 54-65.
- Stuart, F. I. (1993). Supplier partnerships: Influencing factors and strategic benefits. *International Journal of Purchasing and Materials Management*, Fall, 22–28.
- Tan, K. C., Kannan, V. R., Handfield, R. B., & Ghosh, S. (1999). Supply chain management: An empirical study of its impact on performance. *International Journal of Operations & Production Management*, 19(9/10), 1034-1052.
- Tan, K. C., Lyman, S. B., & Wisner, J. D. (2002). Supply chain management: A strategic perspective. *International Journal of Operations and Production Management*, 22(6), pp. 614–631.
- Tracey, M., Vonderembse, M. A., & Lim, J. S. (1999). Manufacturing technology and strategy formulation: Keys to enhancing competitiveness and improving performance. *Journal of Operations Management*, 17(4), 411-428.
- Vokurka, R. J., & Lummus, R. R. (2000). The role of just-in-time in supply chain Management. *International Journal of Logistics Management*, 11(1), 89-98.
- Walker, W. T. (2005). Supply chain flexibility, ASCET Supply Chain White Paper.
- Ward, P., McCreery, J., Ritzman, L., & Shamia, D. (1998). Competitive priorities in operations management. *Journal of Operations Management*, 29(4), 1035-1046.
- Wisner, J. D. (2003). A structural equation model of supply chain management strategies and firm performance. *Journal of Business Logistics*, 24(1), 1-26.
- Yusuf, Y. Y., Adeleye, E. O., & Sivayoganathan, K. (2003). Volume flexibility: The agile manufacturing conundrum. *Management Decision*, 41(7), 613-624.