

Supply Chain Management Practices and Supply Chain Performance Effectiveness

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Abstract: *Supply chain performance effectiveness helps to provide many direct and indirect benefits for suppliers and manufacturing companies where it represents the ability to invent and produce solutions that add more value to (customers) than existing offers, also effectiveness adds great important for both manufacturing companies, supplier network and other parties. By using Resources based view theory the study aims to identify the effects of different dimensions of supply chain management practices (SCMP) on supply chain performance effectiveness (SCPE) of Sudanese manufacturing companies. and The quantitative method was employed, where convenience sampling and self-administrated survey questionnaires were sent to 110 manufacturer companies in Sudan. The study has found many empirical results which indicate that the practices of supplier's management have a significant positive effect on supply chain performance effectiveness. Furthermore the result of factor analysis adds a new dimension for supply chain management practices of Sudanese manufacturing companies. On the other hand the study has some limitations are in its focused on the manufacturing sector. Also the data were only collected from single respondents in an organization. The Practical implications this study it may explain to decision-makers and managers the importance of supply chain management practices on increase the supply chain performance effectiveness*

Keywords: Supply chain management practices, Supply chain Performance, Supply chain effectiveness

1. Introduction

Over the past two decades, supply chain management (SCM), emphasizing the interdependence of buyer and supplier firms working collaboratively to improve the performance of the entire supply, has generated extensive interest in both academic and practitioner communities [1,2].

Supply chain management is an integrated approach beginning with planning and control of materials, logistics, services, and information stream from suppliers to manufacturers or service providers to the end client; it represents a most important change in business management practices [3]. It is one of the most effective ways for firms to improve their performance [4].

SCM includes a set of approaches and practices to effectively integrate suppliers, manufacturers, distributors and customers for improving the long-term performance of the individual firms and the supply chain as a whole in a cohesive and high-performing business model [5].

A successful SCM implementation is expected to enhance the relationship between upstream suppliers and downstream customers, and thereby increase customer satisfaction and firm performance. Prior research has indicated SCM as a key driver of firm performance [6].

Everyone agrees that effective supply chain management can provide a major source of competitive advantage. The goal of a supply chain manager must therefore be to link the end customers, the channels of distribution, the production processes and the procurement activity in such a way that customers' service expectations are exceeded and yet at a lower total cost than the competition

Many SCM studies were conducted in developed countries. Furthermore most of the previous research focuses on the relationship between supply chain management practices

and organizational performance [7, 8, 9, 10, 11, 12, 13, 14, 15]. in the other side the supply chain of performance there are some studies focused on measuring supply chain performance, such as Performance metrics in supply chain management by [16, 17, 18, 19,]. Specifically in the supply chain performance effectiveness. There are very few studies such as [20, 21, 22].

Despite the importance of supply chain practices on supply chain performance there is a lack on studies that link supply chain management practices and supply chain performance effectiveness this study seeking to contribute in filling this gap, SCMP in many developing countries is different from SCMP in developed countries. This study mainly focuses on Sudanese manufacturing companies. Due to the lack of studies this study aims empirically test the relationships between SCM practices and supply chain performance effectiveness of Sudanese manufacturing companies.

2. Concept of the Supply Chain

The definition of supply chain management Is the integration of business processes from end user through original supplies that provides products, services and information that add value to customers [23] "supply chain" seems to be common across authors than the definition of "supply chain management". [24] and Masters proposed that a supply chain is a set of firms that pass materials forward. Normally several independent firms are involved in manufacturing a product and placing it in the hands of the end user in a supply chain – raw material and component producers, product assemblers wholesalers, retailer merchants and transportation companies are all members of a supply chain [24].

2.1 Supply chain management practices (SCM P)

The practice of SCM is refers to complete set of actions which are done in organizations towards to improve the

effectiveness in the internal supply chain. The modern evaluation of the SCM practices that comprises of partnership with the supplier, process of outsourcing, compression of cycle time, continuousness of process flow and sharing of technology and information [13] by using purchasing the quality and relations with the customer SCM practices are defined as a set of activities undertaken in an organization to promote effective management of its supply chain [12]. Supply base management refers to how firms utilize their suppliers processes, technology and capabilities to enhance supply chain performance and competitive advantage and how the manufacturing, logistics, materials, distribution and transportation functions are coordinated within organizations [25], also [26] state that SCM in practice means includes the involved companies planning and strategy for coordination of their supply chain, including collaboration between functions internally as well as across company.

SCM practices are defined also as approaches applied in managing integration and coordination of supply, demand and relationships in order to satisfy consumers in effective and profitable manners. A recent study found that firms often use supplier evaluation or performance measurement to identify specific supplier deficiencies and to develop plans to address them [27]. Such efforts may involve the measurement of supplier's delivery, quality, and cost performance, site visits, certification of supplier's products and processes, and the setting of performance goals.

6aspect of the SCM practices all the way through the factor study, integration of SC, sharing of information, characteristics of supply chain management of client services, physical proximity also the capabilities of just in time (J.I.T) [28] relationship in long-standing communication, cross functional team and participation of vendor for the purpose of measuring the relationship of supplier and buyer strategic supplier partnership with the supplier. It is explained as the long-term based association between company and the supplier. The purpose is achieve the long term based benefits in the way of achieving the organizational benefits [29] It provides the organizations with the supplier and they help the organization in the process of planning and solving any problem. It enables the organization to work effectively and efficiently with the key supplier who are ready to bear the responsibility about the winner or failure of the product and the services. The supplier involvement to designing process of the product and services could be cost efficient [14]. Customer Relationship involves about the managing the complaints of the customers and fast solutions to their problems this helps the organization for maintaining the long term and good relationship with the customers

2.2 The dimensions of supply chain management practices

Many authors studied supply chain management practice and there are various elements and dimensions have measured or used to measure the supply chain practice, for more exploration in the following table some of them:

Table 1: Dimensions of SCM practices

No	Author	Dimensions
1.	Chin et al. 2011	information sharing, customer relationship, strategic supplier partnership, material flow management and corporate culture.
2.	Inda, et al, [35]	Strategic supplier partnership, customer relationship, information sharing
3.	Chowa, et al, [52]	There are four elements (suppliers and customer mgt, information sharing, speed of communication, supply chain features)
4.	Min & Mentzer, [58]	There are seven elements of supply chain practice such as a greed vision and goals, information sharing, risk and award sharing, cooperation, process integration, long-term relationship and a greed supply chain leadership.
5.	Chen & Paulraj [28]	Using supplier base reduction, long-term relationship, communication, cross-functional teams and supplier involvement to measure buyer supplier relationships
6.	Tan, Lyman and Wisner, [14]	Six elements of supply chain practice (using factor analysis) supply chain integration, information sharing supply chain characteristics customer service management, geographical proximity and JIT capability
7.	Alvarado & Kotzab, [59]	Using inter-organizational system in supply chain practice such as EDI, and elimination of excess stock levels by postponing customization toward the end of the supply chain
8.	Tan, Kannan and Handfield [13]	Supply chain practice includes purchasing quality, and customer relations
9.	Donlon, [60]	Supply chain practice includes supplier partnership, outsourcing cycle time compression, continuous process flow and information sharing

3. Customers and Suppliers Management

3.1 Customers Management

Organizations depend on their customers and therefore should understand current and future customer needs, meet customer requirements, and strive to exceed customer expectations. Customer relationship management (CRM) is an important component of SCM [30]. A firm's customer relationship practices can generate the organizational success in supply chain management practices efforts as well as its performance [31] considered that customer

relationship management can be seen as the consistent organizational activity under usage of integrated selling, marketing and service strategy. That is, trying to define the real need of the customer, by the enterprise integrating various process and technology, in asking internal product and service improvement, in order to dawn effort of enhancing customer satisfaction and loyalty.

3.2 Suppliers Management

Supplier's partnership represents the long-term relationship between the organization and suppliers. An effective supplier's management can be a critical component of a

leading edge supply chain [30]. Through strategic supplier partnerships, organizations can work closely with suppliers who can share responsibility for the success of the company. [32] found that the collaboration with other firms or organizations, also include suppliers, has positive significant impact on process innovation and incremental product innovation. Such strategic supplier partnerships should enable successful SCM.

3.3 Supply chain integration

The integration of supply chains has been described by Clancy as: attempting to elevate the linkages within each component of the chain, (to facilitate) better decision making and to get all the pieces of the chain to interact in a more efficient way and thus create supply chain visibility and identify bottlenecks. The main drivers of integration are listed by [33] as:

- the information revolution;
- increased levels of global competition creating a more demanding customer and demand driven markets; and
- the emergence of new types of inter-organizational relationships.

They describe the three principal elements of an integrated supply chain model as being information systems (management of information and financial flows), inventory management (management of product and material flows), and supply chain relationships (management of relationships between trading partners).

The basis of integration can therefore be characterized by cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes. The extent of integration can begin with product design, and incorporate all steps leading to the ultimate sale of the item (Transportation and Distribution, Modern Materials Handling, Some authors also include all activities throughout the useful life of the product including service, reverse logistics and recycling [34].

3.4 Speed of Responsiveness

Inda, Hamid and Tan [35] mentioned 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, 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 [36]. Lumnus, Duclos and Vokurka [37] Show 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

3.5 Information sharing

Information sharing is the ability of the firm in sharing knowledge with supply chain partners in an effective and efficient approach. Effective information sharing is considered as one of the most important abilities of supply chain process. Information sharing is one of the most important tools for achieving an integrated and coordinated supply chain. Lee [38] stated that information should be interoperable, which means that one system can talk to another. Zailani and Rajagopal [40] add that the technological wave of internet and e-commerce provides a new opportunity to create a "smart" integrated supply chain.

Sridharan and Simatupang [39] 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. Internet, Intranet, and Extranet can be distinguished based on characteristics including access, users, and information. The Internet is a public network accessed by general users. However, due to inconsistent format and diversified content, information available on the Internet is fragmented. By comparison, the Intranet, via Internet technologies, is a private network set up within an organization; information is proprietary and only available for members within the organization.

4. Supply Chain Performance

4.1 Supply chain management measurement

Efficiency and effectiveness have been used as key indicators measuring supply chain performance. Two well-known indicators are cost-containment and performance reliability constructs. Cost-containment indicator includes such activities as cost in and outbound activities, warehousing costs, and inventory-holding cost, and increasing asset turnover. Reliability indicator addresses such areas as order fulfillment rate, inventory turns, safety stocks, inventory obsolesces, and number of product warranty claims [41]. In this study supply chain performance is associate with supply chain performance effectiveness

4.2 Supply chain performance Effectiveness:

Basically, there are two underlying approaches to the concept of effectiveness in organization theory, namely external and internal approaches [42]. External approach to organizational effectiveness, the most widely used effectiveness criterion of a goal-attainment model, defines organizational effectiveness as the accomplishment of a set of organizational goals and objectives [42]. The internal approach to organizational effectiveness, on the other hand, is based on a well managed system and competent internal processes. An organization has a well managed system if its members are highly integrated, information flows smoothly, and employees achieve good performance, enjoy job satisfaction and are committed to the organization. Effectiveness is define as the resource getting

ability, and refers to absolute level of outcome attainment [43]. and also defined as the ration between the actual output and normal or expected output [22]. In the logistic it has been described as the ability to achieve pre-defined objectives defined logistic effectiveness as the extent to which the logistics function is goals are accomplished

4.3 RBV Theory

Green, McGaughey and Casey [44] and Zailani and Rajagopal [40] show a relationship between **supply chain management practices** and performance improvement. These results have been nuanced by [45] who has show that the impact of supply chain management practices on performance is not as visible in smaller companies as in larger ones. Moreover, in the past 20 years, this dimension of performance and/or organizational competitiveness has been analyzed under the angle of the resource-based view (RBV). According to this theory, the competitiveness of any organization is based on the resources it masters to develop core competencies.

Sezen [46] mentioned Increasing the level of integration and information sharing, communication, and relationship management among the members of a supply chain has become a necessity for improving the effectiveness of supply chains. Such cooperative behaviors of firms provide rapid access to the required information, more sensitivity towards the needs of the customers, and faster response times than the competitors. many others studies showing cooperative information sharing among supply chain members improve competitiveness and effectiveness of supply chains [47, 48, 7]

Based on the discussion of the literatures, the research framework is shown in Figure 1

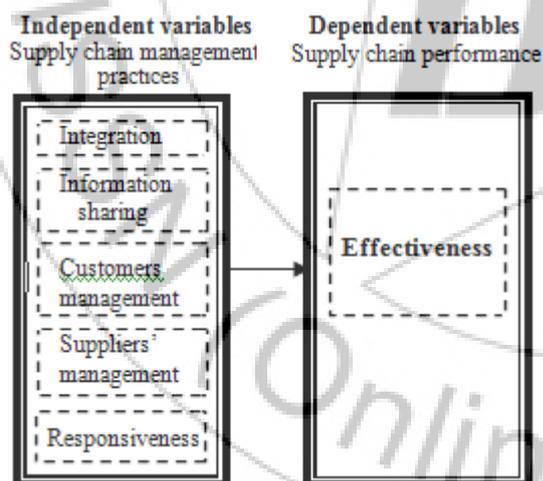


Figure 1: The Study framework

H.1 supply chain management practices positively related to the supply chain performance effectiveness.

Narasimhan and Kim [45] stated that supply chain efficiency can only be realized through the various interaction of SCMP. This view is supported by others studies [49] and consensus emerged in that SCMP should shift from function to integrative in order to value its performance effectiveness. Specifically, [45] provided empirical evidence to show how

SCMP could potential enhance organization's competitive capabilities such as cost leadership, customer service, and product differentiation. Recent studies [50, 51] also indicated that the SCMP have a common goal of ultimately improving organizational performance. For instance, Koh et al. [50] identified that SCMP have significant direct positive impact on organizational performance event in small and medium enterprises. As a whole, previous literature forms a strong consensus on the positive link between SCMP and SCP. From the above hypothesis the sub hypotheses will be as follow:

H1.1 Supply chain integration positively related to the supply chain performance effectiveness.

H1.2 Supply chain information sharing positively related to the supply chain performance effectiveness

H1.3 Supply chain Customers management positively related to the supply chain performance effectiveness

H1.4 Supply chain suppliers management positively related to the supply chain performance effectiveness

H1.5 Supply chain responsiveness positively related to the supply chain performance effectiveness

5. Research Methodology

5.1 Sampling

A framework for data collection and analysis was used based on quantitative approach and non probability convenience sample was used. In order to be consistent with the purpose of this study, manufacturing corporations carrying out all the value chain activities in a supply chain were sampled. The data were collected through questionnaires sent to supply chain managers or top-level executives in 150 large manufacturing corporations among Sudanese listed in and registered in ministry of industry The questionnaires were hand delivered and transmitted by individual visit, and also were sent by email to Sudanese industrial firms. The respondents were mainly supply chain managers, but in cases where a separate organizational entity for SCM did not exist, response was requested from a top-level Executive who was responsible for or well acquainted with supply chain policies and corporate strategies of the firm in Sales, Production, or Planning Department

5.2 Development of the survey instrument

A questionnaire was designed by reviewing relevant theoretical and empirical studies such as [52, 14, 22]. Pilot study was conducted by testing and pre-testing the questionnaire with 30 randomly selected manufacturing companies' respondents. Feedbacks were incorporated and questions were then revised. The final version of the questionnaire consists of 59 closed questions.

The questionnaire of this study consisted of three main sections, namely the profile of the company and implementation of SCMP and specific questions designed to measure the supply chain performance effectiveness constructs. SCMP are measured by using five dimensions. All items of SCMP are measured using Five -point scales ranging from "strongly disagree" to "strongly agree, SCP were adopted from [22]. The study used a five -point Likert scale as a unit of measurement ranging from "more worse" to

“more better Finally, (135) questionnaire were collected after eliminating incomplete survey, there were 110 complete and useable responses, representing a response rate of 80 percent

6. Data Analysis

Finally, after eliminating incomplete survey, there were 110 complete and useable responses, representing a response rate of 80 percent. And the reliability statistic test conducted

6.1 Factor Analysis on supply chain management practices Variables

In conducting factor analysis, this study followed assumptions that recommended by Hair, Black and Anderson, [53]. Firstly, there must be sufficient number of

statistically significant correlations in the matrix. Secondly, Kaiser-Meyer-Olkin measure of sampling adequacy should be at least 0.6. Thirdly, Bartlett’s test of sphericity should be significant at 0.05. Fourthly, communalities of items should be greater than 0.50. Fifthly, the minimum requirement of factor loading 0.50 (since the sample size of this study 110 supply chain managers) based on a 0.05 significant level, with value of cross loading exceeds 0.50. Also to provide a simple structure column for interpretation, the factors were subjected to Varimax rotation. Finally, eigenvalues should be more than 1 for factor analysis extraction. Factor analysis was done on the twenty-three items, which was used to measure **supply chain management practices** constructs. Table 2 showed the summary of results of factor analysis on **supply chain management practices**.

Table 2: Rotated Factor Loading for supply chain management practice

Items No:		Components				
		1	2	3	4	5
Integration						
Inte1	Searching for new way to integrate supply chain activities	.799	.144	.110	.135	.141
Inte2	Improving the integration activities across your supply chain	.736	.223	-.109	.242	.375
Inte5	Involving supply chain on your product service marketing plan	.729	.275	.069	.158	.105
Inte4	Establishing more frequent contact with supply chain members	.671	.075	.377	-.011	.150
Information sharing						
Info1	Creating supply chain management teams to include different companies	.277	.748	.108	.034	-.037
Info4	segmenting customers based on service needs	.095	.747	.066	-.007	.333
Info5	The company is working to create an appropriate information system	.225	.740	.191	-.013	.401
Info2	use of informal information sharing	.083	.734	.060	.199	-.119
Customers & delivery management						
Supp1	On-time delivery directly to customers points of use	.118	.155	.895	.037	.180
Supp2	On-time delivery directly to your firm's points of use	.121	.131	.865	.222	.001
Suppliers management						
Supp5	participating in the sourcing decisions of suppliers	.028	.112	.087	.821	.247
Supp6	The company deals with a third party who specializes in business logistics and supply	.177	.064	.039	.798	-.102
Supp4	aiding suppliers to increase their JIT capability	.250	.008	.284	.565	.316
Speed of Responsiveness						
Spe4	communicating customers' future strategic needs	.181	.043	.056	.088	.817
Spe3	identifying additional supply chain needs	.333	.206	.178	.192	.715
Eigenvalues		5.327	1.640	1.44	1.235	1.018
Percentage of Variance Explain		17.149	16.373	12.681	12.45	12.425
Total Variance Explained (%)		71.07				
Kaiser-Meyer-Olkin (KMO)		.794				
Bartlett’s Test of Sphericity		670.587				

Variables loaded significantly on factor with Coefficient of at least 0.5, * Items deleted due to high cross loading. As shown in Table 1, factor loading of supply chain management practices items on the five factors ranged from 0.565 to 0.895. Thus, this study found that supply chain management practices in Sudanese industrial sector consists of FIVE factors, namely; integration, information sharing speed of Responsiveness, and suppliers management and customers management

Table 3: Rotated Factor Loading supply chain performance

		Effectiveness		
Eff3	Warehousing costs	.144	.865	.180
Eff4	Inventory costs	.231	.838	.105
Eff2	Transportation costs	.108	.813	.288
Eff5	Total logistic costs	.266	.795	.086
Eff1	Sales (SDG)	.436	.509	.316

As shown in Table 4.6, factor loading of supply chain performance effectiveness

6.2 Reliability Analysis

To test reliability this study used Cronbach's alpha as a diagnostic measure, which assesses the consistency of entire scale, since being the most widely used measure. According to Hair, Black and Anderson. [53], the lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory research. While Nunnally [62] considered Cronbach's alpha values greater than 0.60 are to be taken as reliable. The results of the reliability analysis summarized in table (4)

Table 4: Cronbach's Alpha

Construct	Variable	Number of items	Cronbach's alpha
Supply chain management practices	Integration	4	.810
	Information sharing	4	.793
	Customers & delivery management	2	.846
	Suppliers & management	2	.70
	Speed of responsiveness	2	.700
	Supply chain performance effectiveness	5	.886

6.3 Correlation and Descriptive Analysis of supply chain practices & performance effectiveness

6.3.1 Descriptive Analysis of supply chain management practices

Table 5 shows the means of the five dimensions of supply chain management practices: integration, information sharing, Customers & management, Suppliers management, speed of Responsiveness. The table reveals that the Sudanese industrial companies emphasized more on speed of communication (mean=3.7,) followed by supply chain integration (mean=3.7), and then information sharing (mean=3.5) and followed by Customers management (mean=3.4) and the lowest components of supply chain management practices is suppliers management (mean=3.3). therefore those **five** dimensions were achieved average score equal (3.52). Given that the scale used a 5-point scale (1=strongly disagree, 5=strongly agree), it can be concluded that Sudanese industrial companies are highly practicing of supply chain management practices above the average mean.

The Table 5 also shows the means of the: supply chain performance effectiveness. The table reveals that the Sudanese industrial companies emphasized more on effectiveness (mean=3.3. Given that the scale used a 5-point scale it can be concluded that Sudanese industrial companies have high supply chain performance effectiveness above the average mean (3)

The correlation Table 5 presents the results of the intercorrelation among the variables. The correlation analysis was conducted to see the initial picture of the interrelationships among the variables of the study. Therefore, the importance of conducting correlation analysis

is to identify any potential problems associated with multicollinearity [54]. Table 5. represents the correlation matrix for the constructs operationalized in this study. These bivariate correlations allow for preliminary inspection and information regarding hypothesized relationships. In addition to that, correlation matrix gives information regarding test for the presence of multicollinearity.

Table 5. shows that integration is not significantly correlated with supply chain performance effectiveness ($r = .098$, p -value < 0.32), and information sharing not significantly correlated with effectiveness ($r = .105$, p -value < 0.27), and customers & management not significantly correlated with supply chain performance effectiveness ($r = .036$, p -value < 0.70), suppliers management is not significantly correlated with supply chain performance effectiveness ($r = -.093$, p -value < 0.33), and Speed of responsiveness not significantly correlated with supply chain performance effectiveness ($r = .044$, p -value < 0.61)

Table 5: Person's Correlation Coefficient for All Variables

Variables	Mean	W1	W2	W3	W4	W5	X1
Supply chain practice	3.71	1					
W2 information sharing	3.52	.476**	1				
W3 customers & delivery mgt	3.43	.345**	.317**	1			
W3 suppliers management	3.26	.413**	.245*	.306**	1		
Speed of responsiveness	3.72	.538**	.381**	.296**	.369**	1	
X2 Effectiveness	3.3	0.098	0.105	0.03	-0.094	0.044	1

** $p < .01$ * $p < .05$

The Relationship between supply chain management practices and supply chain performance effectiveness
Similar analysis was conducted for the relationships between **supply chain management practices** and effectiveness. Table 5 shows the results of the hierarchical regression equation testing the influence of the **supply chain management practices** variables on effectiveness. The **supply chain management practices** variables explained 48.725% of the variance in effectiveness. However, the result shows that the model is significant. In addition the results show that two of the **five** components of **supply chain management practices** is a positive significantly influenced supply chain effectiveness. The results showed that the hypothesis was supported, i.e. there is a positive relationship between **supply chain management practices** and effectiveness. The results also showed that suppliers management have the most significant effect on effectiveness ($\beta = 0.232$, $p < 0.05$), followed by integration ($\beta = 0.181$, $p < 0.15$), and information sharing ($\beta = 0.046$, $p < 0.68$) followed by customers management ($\beta = -0.022$, $p < 0.84$), and speed of Responsiveness ($\beta = 0.068$, $p < 0.56$). These results give support to hypotheses H1.2a (suppliers management and effectiveness), H1.2b (integration and effectiveness), and H1.2c (customer management and effectiveness), H1.2d (speed of Responsiveness and effectiveness). Therefore, these results provide support for the assertion that the effort to

become **supply chain management practices** does lead to the creation of supply chain effectiveness.

Table 6: Multiple Regressions: supply chain management practices Variables, and supply chain effectiveness (Beta coefficient)

<i>Variables</i>	<i>Effectiveness</i>
Supplier s management	.232**
Integration	.181
Information sharing	.046
Customers management	.021
Speed of responsiveness	.068
R ²	.069
Adjusted R ²	.022
Δ R ²	.069
F change	1.475 ***

Note: Level of significant: *p<0.10, **p<0.05, ***p<0.000

7. Discussion and Conclusion

From the results achieved by data analysis one of the interesting finding is that the **suppliers management practices** have influence on supply chain performance effectiveness. The managing of suppliers is considered one of the factors that affect the total cost of the supply chain management and therefore suppliers could help to reduce the cost and thus may contribute to improve performance through effectiveness. Studies related to supply chain practices in the manufacturing and automotive sector find a significant relationship between suppliers and manufacturers competitive priorities and practices [56]. Moreover, other results reveal that integration has influence on supply chain effectiveness. Recent years have seen growth in the importance of integration suppliers, manufacturers and customers [56] Effective integration of suppliers into supply chains serves as a key factor to some companies to gain competitive advantage Also another results show that there are no relationship between (integration, information sharing, speed of Responsiveness , customer management) and effectiveness, Information sharing sometimes may not have influence on supply chain performance as a result companies are uncertain or doubtful that information will be used unfairly to their disadvantages and this may cause a divergent interest and opportunistic behavior of supply chain partners. This informational asymmetry has potential negative effect on the supply chain performance. Choy, et.al [61] mention that high cost of transaction will be involved if information cannot be communicated effectively with partners in supply chain that may not help to improve supply chain performance through effectiveness. in addition, integration sometimes the high level of integration between organization may reduce their ability and willingness to make rapid changes in trading relationship that may reduce the effect of integration on effectiveness of supply chain ,according to the result that customer relationship management has no effect on supply chain effectiveness, the customers management may not directly have effect on supply chain effectiveness due to the supply chain implementation complexity that (supply chain) could only be implemented through many elements: for example the supply chain processes, the supply chain network structure, and the management components. These elements may affect the degree of supply chain performance effectiveness

through the customer management practice, which in turn affects the overall effectiveness of supply chain performance [57]

This study has provided empirical justification for a framework that identifies five constructs of supply chain management practices and describes the relationship among SCMP and supply chain performance effectiveness within the context of Sudanese industrial sector. Previous studies supporting the importance of SCMP mostly used and relate SCMP to organizational performance and not with SCP. The major contribution of the present study is the development of a dimensions of SCMP constructs through comprehensive perspectives and, accordingly, examining its impact on SCP. Based on a survey data of 110 manufacturing firms, this study carries more weight especially for generalization purpose due to the limited quantitative approach in the extant literatures. As a whole, effective SCMP have important implications for SCP.

Among the limitations of this study is the use of only one respondent per company. Also, this study depends on a questionnaire survey at one point in time from a manufacturing sector. therefore Future research should, endeavor to collect data from multiple members across the supply chain, including semi structured interviews. as well Future research should develop SCM practices dimensions, and focus on measuring new dimensions of supply chain performance effectiveness and future scope it's better to focusing on the factors effect on effectiveness of supply chain.

This study offers a number of managerial implications. First, it provides to the SCM managers with Appropriate formula for evaluating the effectiveness of the supply chain performance moreover a new dimensions of supply chain management practices also developed . Second, the results also indicates that supply chain management practices might directly influence on supply chain performance effectiveness, In the long term the success of Sudanese industrial firms is heavily may dependent on its supply chain practices, and Finally the theoretical contributing of the study that its provide to scholars new avenues for future research, and as well as extracting new dimension, and using a triangulation methodology

References

- [1] Shin H, Collier DA, Wilson DD. (2000), Supply management orientation and supplier/buyer performance. *J. Oper. Manage.*, 18(3): 317–333
- [2] Narasimhan R, Kim SW (2007). Effect of supply chain integration on the relationship between versification and performance: Evidence from Japanese and Korean firms. *J. Operation . Management.*, 20: 303- 323.
- [3] Fantazy KA, Kumar V, Kumar U (2010). Supply management practices and performance in the Canadian hospitality industry. *Int. J. Hosp. Manage.*, 29(4): 685-693
- [4] Ou CS, Liu FC, Hung YC, Yen DC (2010). A structural model of supply chain management on firm performance. *Int. J. Oper. Prod. Manage.*, 30(5): 526-545.

- [5] Chopra S, Meindl P (2001). Supply Chain Management. Prentice-Hall, Englewood Cliffs, NJ
- [6] Wisner, J. D., Leong, G. K., & Tan, K.-C. (2005). Principles of supply chain management. Ohio, US: Thomson South-Western
- [7] Yap Lang Ling , Cheng Ling Tan (2012)The Effect of Service Supply Chain Management Practices on the Public Healthcare Organizational Performance” International Journal of Business and Social Science Vol. 3 No. 16 [Special Issue pp.212-224
- [8] Gunasekaran, A. Patel, C. & Tirtioğlu, E. (2011). Performance measurement and metrics in a Supply chain environment. *International Journal of Operations & Production Management*, Vol. 21, 71-87
- [9] Kurien G. P., M.N. Qureshi(2011). Study of performance measurement practices in supply chain management, *International Journal of Business, Management and Social Sciences* Vol. 2, No. 4, pp. 19-34
- [10] Lockamy III, A. and McCormack, K., 2004. Linking SCOR planning practices to supply chain performance: An exploratory study. *International Journal of Operations & Production Management*, Vol. 24, No. 12, pp. 1192-1218
- [11] Premus R. NR Sanders, R Premus , 2002 IT applications in supply chain organizations: a link between competitive priorities and organizational benefits *Journal of business logistics* Wiley Online Library
- [12] Suhong Lia,*, Bhanu Ragu-Nathanb, T.S. Ragu-Nathanb, S. Subba Raob,(2006) The impact of supplychain management practices on competitive advantage and organizational performance,the international Journal of Management Science Omega 34 107 – 124
- [13] Tan, K. C., Kannan, V. R., & Handfield, R. B. (1998). Supply chain management: Supplier performance and firm performance. *International Journal of Purchasing and Materials Management* 34(3), 2–9
- [14] 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), 614– 631
- [15] Sonja Petrovic-Lazarevic, Amrik Sohal & Imam Biahqi (2007).supply chain management practices and supply chain performance, Monash University –Management Departement, Working paper.Australia.pp.1-16
- [16] Bhagwat Rajat, Milind Kumar Sharma.(2007).Performance Measurement of Supply Chain Manaement :A balanced Scored Approach. *Computer and Industrial Engineering Journal* 53: 43-62
- [17] Cao, N., Zhang, Z., To, K. M., & Ng, K. P. (2008). How are supply chains coordinated? An empirical observation in textile-apparel businesses. *Journal of Fashion Marketing and Management*, 12 (3), 384-397
- [18] A.Gunasekaran,*, C. Patelb, Ronald E. McGaughey.(2004) A framework for supply chain performance measurement. *Int. J. Production Economics* 333–347
- [19] Kleijnen, J. P. C. & Smits, M. T.(2003)Performance metrics in supply chain management *Journal of the Operational Research Society*. 54, 5, p. 507-514
- [20] Borgström Benedikte (2005) Exploring efficiency and effectiveness in the supply chain A conceptual analysis,pp 1-21
- [21] Sabbaghi Asghar, and Ganesh Vaidyanathan.(2008) Effectiveness and Efficiency of RFID technology in Supply Chain Management: Strategic values and Challenges. *Journal of Theoretical and Applied Electronic Commerce Research* ISSN 0718–1876 Electronic Version VOL 3 / ISSUE
- [22] Brian S. Fugate, John T Mentzer; Theodore P Stank,(2010) Logistic Performance: efficiency, Effectiveness, and Differentiation, *Journal of Business Logistics*; ABI/inform Global p. 43-55
- [23] Galaskiewicz Joseph (2011)Studying Supply Chains From A Social Network Perspective *journal of Supply Chain Management* Volume 47, Issue 1, pages 4–8
- [24] Lalonde BJ 1998. Building a supply chain relationship. *Supply Chain Review* ;2(2):1–8.
- [25] Billington, C., Lee H.L. and (1992), Managing supply chain inventory: pitfalls and opportunities", *Sloan Management Review*, Vol. 33, pp. 65-73
- [26] Mentzer, JT 2001, ‘*Supply Chain Management*’, SAGE Publications, *International Education and Professional Publisher*
- [27] Krause, D.R. and T.V. Scannell(2002). “Supplier Development Practices: Product and Service Based Industry Comparisons,” *Journal of Supply Chain Management*, (38:2), pp. 13-21.
- [28] Chen Injazz . Antony Paulraj. (2004). Towards a theory of supply chain management: the onstructs and measurements. *Journal of Operations Management* 22 pp 119–150
- [29] Stuart, F.I. (1997), “Supply-chain strategy: organizational influence through supplier alliances”,*British Journal of Management*, Vol. 8, pp. 223-236.
- [30] Gharakhani,Davood Reza Kiani Mavi and Nasser Hamidi. (2012) Impact of supply chain management practices on innovation and organizational performance in Iranian. *African Journal of Business Management* Vol. 6(19),. 5939-5949
- [31] Ruben Vrijhoef and Lauri Koskela.(1999) Roles of Supply Chain Management in Construction, University of California, Berkeley, CA, USA, pp 134- 136
- [32] Radas S, Bož'ic' L (2009). The antecedents of SME innovativeness in an emerging transition economy. *Technovation*, 29: 438-450
- [33] Handfield, R. and Nichols, E.L. Jr (1999), *Introduction to Supply Chain Management*, Prentice- Hall, Upper Saddle River, NJ.
- [34] Ballou H. Ronald (2000). *Logistics, Supply Chain and Transport Management*. The Cambridge International College,logistic program Chapter 1.p.5-6
- [35] Inda Sukati, Abu Bakar Abdul Hamid, Huam Hon Tat, Fazila Said(2012),A study of Supply Chain Management Practices: AN Emperical Investigation on consumer goods industry in malaysia, *International Journal of Business and Social Science* Vol. 2 No. 17,pp.166-176
- [36] Christopher, M. and Peck, H. (2004), “Building the Resilient Supply Chain”, *International Journal of Logistics Management*, 15(2), pp. 1-13.
- [37] Lummus, R. R., Duclos, L. K., and Vokurka, R. J. (2003), “Supply Chain Flexibility: Building a New

- Model”, Global Journal of Flexible Systems Management, 4(4), pp. 1-13
- [38] Lee, H.L. (2002), “Aligning supply chain strategies with product uncertainties”, California Management Review, Vol. 44 No. 3, pp. 105-10.
- [39] Simatupang, T. M. and Sridharan, R. (2002), “The Collaborative Supply Chain”, International Journal of Logistics Management, 13(1), pp. 15-30.
- [40] Zailani Suhaiza Premkumar Rajagopal, (2005), "Supply chain integration and performance: US versus East Asian companies", Supply Chain Management: An International Journal, Vol. 10 Iss: 5 pp. 379 – 393
- [41] Lee Chang Won, Ik-Whan G. Kwon and Dennis Severance (2007) Relationship between supply chain performance and degree of linkage among supplier, internal integration, and customer, Supply Chain Management: An International Journal, Volume 12 • 444-452
- [42] Haron Bin MD. Harashid, (2007) logistic strategic orientation and logistics performance : the roles OF organizational structure and complexity, Thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy university Sains Malaysia
- [43] Osttroff, cheri and neal Schmitt. (1993), configuration of organizational effectiveness and efficiency” academy of management Journal, vol36 ,p. 1345
- [44] Green, K.W. Jr, McGaughey, R. and Casey, K.M. (2006), “Does supply chain management strategy mediate the association between market orientation and organizational performance? Supply Chain Management: An International Journal, Vol. 11 No. 5, pp. 407-14.
- [45] Kim Soo Wook, (2006), "Effects of supply chain management practices, integration and competition capability on performance", Supply Chain Management: An International Journal, Vol. 11 Iss: 3 pp. 242
- [46] Sezen, B. (2008), “Relative effects of design, integration and information sharing on supply chain performance”, Supply Chain Management: An International Journal, Vol. 13 No. 3, pp. 233-40
- [47] Ellram, L.M. and Cooper, M.C. (1990), “Supply chain management, partnership, and the shipper- third party relationship”, The International Journal of Logistics Management, Vol. 1 No. 2, pp. 1-10
- [48] Li, S., Ragu-Nathan, B., Ragu-Nathan, T.S. and Rao, S.S.(2006), “The impact of supply chain management practices on competitive advantage and organizational performance”, OMEGA, Vol. 34 No. 2, pp. 107-24
- [49] Dawe, R.L. (1994), “An investigation of the pace and determination of information technology use in the manufacturing materials logistics system”, Journal of Business Logistics, Vol. 15 No1 pp. 229-58
- [50] Koh, S.C.L., Demirbag, M., Bayraktar, E., Tatoglu, E. and Zaim, S. (2007), “The impact of supply chain management practices on performance of SMEs”, Industrial Management & Data Systems, Vol. 107 No. 1, pp. 103-24
- [51] Fu-ren Lin, Yu-wei Sung, Yi-pong Lo. (2005) Effects of Trust Mechanisms on Supply-Chain Performance: A Multi-Agent Simulation Study. International Journal of Electronic Commerce, Vol. 9, No. 4 91- 112
- [52] Chowa S.Wing, Christian N. Madub, Chu-Hua Kueib, Min H. Luc,Chinho Lind, Hojung Tseng (2008), Supply chain management in the US and Taiwan: the international journals of management science, Omega 36665 – 679.
- [53] Hair, J. F., Black, B., Babin, B., Anderson, R. E., and Tatham, R. L. (2010). Multivariate Data Analysis (7 ed.): Prentice Hall
- [54] Sekaran, U. (2000), Research Methods for Business: A Skill Building Approach, 3rd ed., Wiley, New York, NY
- [55] Ana Beatriz Lopes de Sousa, Alceu Gomes Alves Filho, Adriana Backx Noronha Viana c, Charbel Jos_e Chiappetta Jabbour, (2011) Factors affecting the adoption of supply chain management practices: Evidence from the Brazilian electro-electronic sector, IIMB Management Review 23, 209- 221
- [56] Leenders, M. R., H. E. Fearon, A. E. Flynn and P. F. Johnson (2001). Purchasing and Supply Management. Boston, McGraw Hill
- [57] Lambert DM, Cooper MC. (2000) Issues in supply chain management. Industrial Marketing Management ;29:65–83
- [58] Min s., Mintzer J. (2004) Developing and measuring supply chain management concepts. Journals of business logistics (25)1 p 63-92
- [59] Alvarado, U. Y., & Kotzab, H. (2001). Supply chain management: The integration of logistics in marketing Industrial Marketing Management, 30, 183-198.
- [60] Donlon, JP 1996, ‘Maximizing value in the supply chain’ , *Chief Executive*, 117, October, pp.54–63
- [61] Choy,K.,Lee,w.,Lo v,(2004) an enterprise collaborative management :a case study of suppliers relationship, journal of enterprise information management .191
- [62] Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill

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