



Investigation into the Relationship between Supply Chain Management Practices and Supply Chain Performance Efficiency

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Purpose –this paper aims to investigate the effects of different dimensions of supply chain management practices (SCMP) on supply chain performance efficiency (SCPE) in the industrial sector in the Sudan.

Design/methodology/approach – The study employed the quantitative method where convenience sampling and self-administrated survey questionnaires were sent to 110 manufacturing companies in Sudan.

Findings – The empirical results indicate that three of the five dimensions of SCMP had a significant positive effect on supply chain performance efficiency. Moreover, a new dimension was developed in supply chain management practices.

Research limitations/implications – This study focuses only on the manufacturing sector. Also the data were only collected from single respondents in an organization. However, being the first study to explore the dimensions of SCMP and how those dimensions relate to supply chain performance efficiency, the study shapes the pathway for future research.

Practical implications – The results lighted to SCM practitioners and policy makers on the importance of SCMP to increase the performance of manufacturing industry in terms of supply chain performance efficiency.

Originality/value – This study developed framework based on existing theoretical base and employs a new approach to empirically examine the relationship between two important factors, the SCMP and supply chain performance efficiency.

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INTRODUCTION

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 customer; it represents one of the most important change in business

management practices It is one of the most effective ways for firms to improve their supply chain performance (Ou *et al.*, 2010).

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 (Tan, 2002) in another word The effective supply chain management can provide a major source of competitive advantage therefore the goal of a supply chain manager is 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 competitors Companies try to improve their supply chain performance in terms of cost, delays, adaptability, variety and traceability. Collaboration and information exchange between partners becomes essential within any supply chain.

Many SCM studies were conducted in developed countries. most of the previous studies focus on the relationship between supply chain management practices and organizational performance (Chin *et al.*, 2004; kurien and Qureshi, 2011; Lockamy and McCormack, 2004; Suhong *et al.* 2006; Sahay and Mohan,2003; Tan *et al.*, 2002; lazarvec, *et al.*, 2007) beside that there are some studies conducted on measuring of supply chain performance, such as Performance metrics in supply chain management by (Bhagwat and Milind 2007; Gunasekaran *et al.*, 2004; Kleijnen, and Surts 2003). Efficiency and effectiveness have been used as key indicators measuring supply chain performance (Lee *et al.*, 2007;

(Beamon, 1999; Holmberg, 2000 ; Li *et al.*, 2006; Tan *et al.*, 1998) Despite the importance of supply chain practices in supply chain performance there is a lack of studies that link supply chain management practices and supply chain performance efficiency this study seek to contribute in filling this gap, SCMP in many developing countries is different from SCMP in developed countries. Therefore the purpose of this study is to empirically test a framework identifying the relationships of SCM practices, efficiency of supply chain performance in Sudanese manufacturing companies.

The Concept of Supply Chain management:

supply chain management is integration of business processes from end user through original supplies that provides products, services and information that add value to customers (Galaskiewicz, 2011; Cooper *et al.*, 1993) also supply chain management can be defined 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 (Dag and Steven, 2010).

Supply Chain Management Philosophy:

Supply chain management as management philosophy takes a system approach to viewing the supply chain as single entities. This means that the partnership concept is extended into a multi firm effort to manage the flow of goods from suppliers to the ultimate customers (Klemencic, 2006). Thus supply chain directly and indirectly affects the

performance of all the other supply chain members, as well as ultimate, overall supply chain performance (Cooper *et al.*, 1997).

Supply Chain Management Practices:

The SCM practices refer to complete set of actions which are done in organizations towards to improve the efficiency 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 or technology and information by using purchasing the quality and relations with the customer (Tan *et al.*, 1998)

SCM practices are defined as a set of activities undertaken in an organization to promote effective management of its supply chain (Suhong *et al.*, 2006). 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 (Farley, 1997). (Billington and Lee, 1992), also Mentzer *et al.*, (2001) 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 also defined as approaches applied in managing integration and coordination of supply demand and relationships in order to satisfy consumers in effective and profitable manners. Tan *et al.*, (2002) mentioned that many firms have reduced their supply base so they can more effectively manage relationships

with strategic suppliers. They may reverse their downsizing emphasis and bring outsourced products and services back –in house, source alternative sources of supply, or work with existing suppliers to increase their performance and capabilities. Suppliers development efforts vary in terms of the effort expended by the buying firm and in the variety of tools used. Chen and Paulraj, (2004) propose that There are six Aspects 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)another point of view relationship in long-standing communication, cross functional team and participation of vendor for the purpose of measuring the relationship of supplier and buyer It is explained as the long-term based association between company and the supplier. The purpose is to achieve the long term based benefits in the way of achieving the organizational benefits: 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 success or failure of the product and the services. The supplier involvement to designing process of the product and services could be cost efficient (Stuart, 1997; Monczka, and Petersen, 1998) in the other side of relationship Customer Relationship involves 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 (Tan *et al.*, 2002).

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 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 draw effort of enhancing customer satisfaction and loyalty.

Suppliers Management

The aim of supplier management is to achieve an optimal flow of high-quality, value-for-money materials and/or components from innovative suppliers (Goffin et al., 1997). In this situation, the new role of the purchasing manager has been described as an 'information exchange broker, for that. The nature of supplier-manufacturer relationships are changing from arm's-length relationships to close partnerships, 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 (Gharakani, et al. 2012). Through strategic supplier partnerships, organizations can work closely with suppliers who can share responsibility for the success of the company.

Supply Chain Integration

The integration of supply chains has been described 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 (Handfield and Nichols 1999) 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.

Handfield and Nichols (1999) described 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 (Jayaram and Tan, 2010). The extent of integration can begin with product design, and incorporate all steps leading to the ultimate sale of the item Transportation and Distribution; (Stevens 1989) stated that to developing an integrated supply chain that evolving number of stages

Stage1 ("base line") is typified by the company that vests responsibility for different activities in the supply chain in separate, almost independent, departments. Even in Relatively small concerns the "base line"

Stage 2 companies typically apply time phased planning to the materials and manufacturing management areas using material requirement planning (MRP) or MRPII techniques. Within

the distribution network, demand will continue to be aggregated

Stage 3 stage of development recognises that there is very little point in just focusing on the flow of goods into the organisation unless the flow is well managed on the way to the customer. This stage involves the integration of those aspects of the supply chain directly under the control of the company and embraces outward goods management, integrating supply and demand along the company's own chain

Stage 4 that full supply chain integration is achieved by extending the scope of integration outside the company to embrace suppliers and customers

Speed of Responsiveness

Mohaghar *et al.*, (2011) defined it as a meaningful and on time share of information in a formal or informal ways between companies effective two-way communication is demonstrated throughout the literature as essential to successful supplier relationship.

Effective interorganizational communication could be characterized as frequent, genuine, and involving personal contacts between buying and selling, personnel or customer, supplier (Olsen and Ellram, 1997). In order to jointly find solutions to material problems and design issues, buyers and suppliers must commit a greater amount of information and be willing to share sensitive design information the quality of communication, information sharing and participation are all significant predictors of successful SC relationships. (Mohaghar *et al.*, 2011)

Information Sharing

Information sharing refers to exchange of information among companies, customers and suppliers, and the information should be interoperable, which means that one system can talk

to another. 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. The Information links between internal primary data repositories and business applications and those of partners allow faster demand forecasting and planning (Zailani and Rajagopal.2005). This beside the technological wave of internet and e-commerce which provides a new opportunity to create a "smart" integrated supply chain. Exchange information with suppliers it may required to determines how much information shared affects the company-supplier bond. Narasimhan and Kim (2002) lists market information exchange between company and suppliers as an indirect determinant of performance. Level of organization linkage with customers through information network. Organization linkage refers to the bond between the company and customer(s). Formation of an informal information network helps in company-customer information sharing, which directly strengthens the bond between them (Narasimhan and Kim, 2002).

Supply Chain Performance

In the context of a dynamic supply chain, continuously improving performance has become a critical issue for most suppliers, manufacturers, and the related retailers to gain and sustain competitiveness. Supply Chain Performance is defined as the multiple measures of performance developed by the organization to gauge the ability of a supply chain to meet an organization's long-term and short-term objectives. Performance measurement is the process of quantifying the effectiveness and efficiency of action

(Neely *et al.* (1995). a complex performance management system includes many management processes, such as identifying measures, defining targets, planning, communication, monitoring, reporting and feedback (Cao *et al.*, 2008) supply chain Performance measurement is critical for companies to improve supply chains' effectiveness and efficiency Decision-makers in supply chains usually focus on developing measurement metrics for evaluating performance. (Shepherd, and Gunter 2006)

Sambasivan and Jacob (2009) defines measure as a more objective or concrete attribute that is observed and measured and metric as an abstract, higher-level latent attribute that can have many measures. Because SC is a network of firms that includes material suppliers, production facilities, distribution services and customers linked together via the flows of materials, information and funds (Gunasekaran *et al.*, 2001), the measures have been classified as follows: fund flow (cost and profitability), internal process flow (production level flexibility, order fulfillment and quality), material flow (inventory and internal time performance), sales and services flow (delivery performance, customer responsiveness and customer satisfaction), information flow and partner relationship process flow (supplier evaluation and sharing of information with suppliers and customers).

The Supply Chain Performance

Efficiency:

Organizational efficiency is defined as an internal standard of performance and is approximately a construct “for doing the things right. (Borgström, 2006) efficiency refers to the internal functioning of logistic and generally is

considered best represented through some ratio of the normal level of inputs to the real level of outputs (Fugate, et al.2010). Efficiency specifically, it is the ratio of resources utilized against the results derived from resource dependence perspective efficiency is an independent measure for evaluating organizational productivity:

Efficiency is seen as a “value free” quantifiable measure – highly valued as a rationale for activities such as improvement programs or as a base for rewards the efficiency is therein described as a compound evaluation of quality, delivery, cost, and overall capability that is not only planned and reviewed in the relationship but also a measure of the relationship. Efficiency is thus evaluated of several parties within the exchange system and negotiated interdependencies determine efficiency goals. two elements are left to elaborate on from the formula of efficiency: Resources utilized and losses. Utilization of scarce resources has cost implications but also implications regarding capability to innovate (Fredriksson and Gadde, 2003). This implies that losses in an evaluation of one firm or one relationship are efficiency to the supply chain. Efficiency thereby means exploitation of interdependencies, reliability and control of Resources. Thus, the supply chain efficiency as an internal standard of performance (Borgström, 2006)

Resource Based View (RBV) Theory

Whitten and Green et al. (2006) show a relationship between supply chain management practices and performance improvement. (Kim, 2006) 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 (Whitten *et al.*, 2010) Sezen, (2008) mentioned increasing the level of integration and information sharing, communication, and relationship management among the members of a supply chain has become anecessity 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 other studies in supply chain (Suhong *et al.*, 2006; Lee, 2002; Zhao and Xie 2002). Showing cooperative information sharing among supply chain members improves competitiveness and effectiveness of supply. Based on the discussion of the literatures, the study framework is shown in Figure1

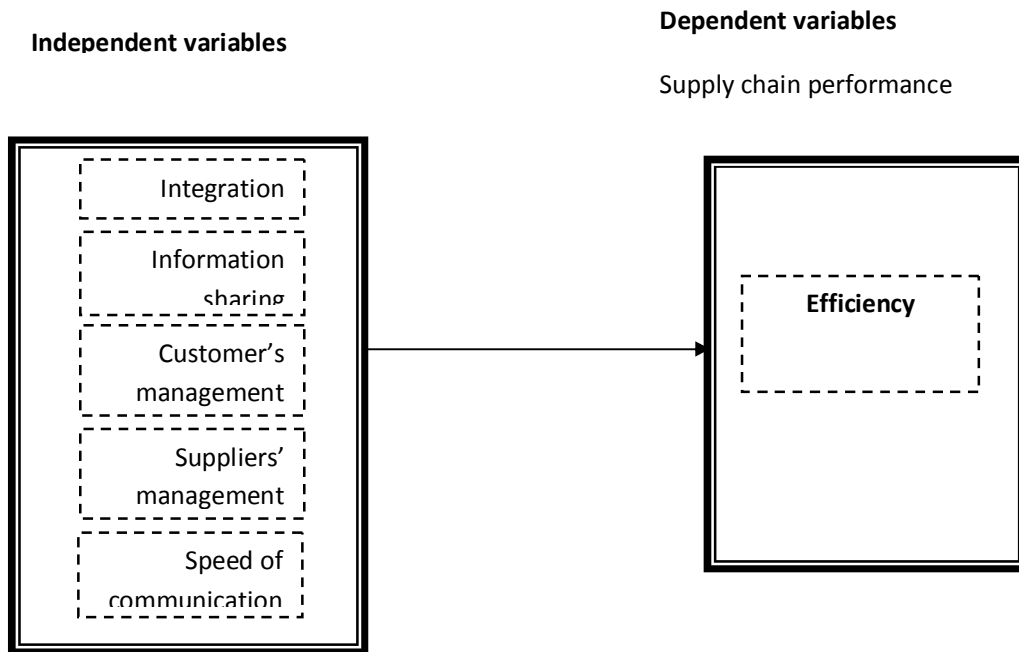


Figure (1) The study framework

H.1 Supply chain management practices positively related to the supply chain Performance efficiency.

Kim. (2006) stated that supply chain efficiency can only be realized through the various interaction of SCMP. This view is supported by others studies (Dawe, 1994) and consensus emerged in that SCMP should shift from function to integrative in order to value its performance efficiency. Specifically, Kim (2006) provided empirical evidence to show how

SCMP could potential enhances organization's competitive capabilities such as cost leadership, customer service, and product differentiation. Recent studies (Koh *et al.*, 2007; Li *et al.*, 2006) also indicated that the SCMP have a common goal of ultimately improving organizational performance. For instance, Koh *et al.* (2007) 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 is positively related to the supply chain performance efficiency.

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

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

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

H1.5 Supply chain responsiveness speed is positively related to the supply chain performance efficiency

Research Methodology

Sampling

Consistent with the purpose of this study, manufacturing firms 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 110 large manufacturing firms among Sudanese listed and registered corporations. The questionnaires were transmitted by individual visit, and email to Sudanese

Table 1: Response Rate

Total Questionnaires sent to the companies	135
Returned questionnaires (not filled- up)	8
Completed questionnaire received from respondents	110
Returned questionnaires (partially answered)	2
Questionnaires not returned	15
Overall response Rate	81.4%
Usable response Rate	80.%

Respondents Characteristics

manufacturing 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 of sales, production, or planning department who was responsible for or well acquainted with supply chain policies and corporate strategies of the firm. The used sample was an convenience sample, and the unit of analysis is a company

Development of the Survey Instrument

The questionnaire for 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 efficiency constructs

SCMP were 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 Fugate *et al.* (2010). We use a five -point scale as a unit of measurement ranging from “more worse” to “more better

Data Analysis

Finally, after eliminating incomplete data, there were 110 complete and useable responses, representing a response rate of 80 percent.

The data analysis shows the companies profile characteristics that: the company types (Engineering sector) represents (31.8%) as higher ratio and followed by (Food sector) was (21.8%) and then followed by (Chemical sector) that present (17.3%). whereas the Printing & packing present (13.6) then Contractures sector that present (12.7) , and lastly as lower, the Leather sector (2.7) regarding the company's ownership, majority of the companies were owned by private company (67.3%) as a high ratio, followed by Joint venture (16.4%) and Distributorship (16.4%) of concerning for the companies age, most of these companies were age less than 10 years) present (43.6%) Then comes after the companies, which were between (15 less than 20 years) as (20%) followed by the companies which were age between (10 and less 15) present (18.2%) and comes the companies which were ages above than (20 years) is (18.2%).

As for the companies number of employees the most of the companies surveyed the number of employees were between (1 and less than 50) (41.9%) and then followed by companies which their employees (above 200) (29.1%), followed by companies which their employees between (51-100) (19.1%) (and lately comes the companies which their employees between (51 and less than 100) (10 %) According to the type of products produced by the surveyed companies show that the raw material extractor/manufacturer present (18.1%), and also comes the

companies that as Wholesaler, Retailer, Trading company (30.9%) and lastly comes the companies that produce Final product manufacturer (50.9%) as higher ratio finally according to the type of customer who uses the products of companies shows that the companies that distribute its products to End users were account (44.5%) followed by Wholesalers (27.3%) , and lately comes manufacturing users (25.5%)

Factor Analysis for supply Chain Management Practices Variables

In conducting factor analysis, this study followed assumptions that recommended by (Hair, Anderson, Black, 2010). 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 were 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							
Suppl1	On-time delivery directly to customers points of use	.118	.155	.895	.037	.180	
Suppl2	On-time delivery directly to your firm's points of use	.121	.131	.865	.222	.001	
Suppliers management							
Suppl5	participating in the sourcing decisions of suppliers	.028	.112	.087	.821	.247	
Suppl6	The company deals with a third party who specializes in business logistics and supply	.177	.064	.039	.798	-.102	
Suppl4	aiding suppliers to increase their JIT capability	.250	.008	.284	.565	.316	
Speed of communication							
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 2, 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 communication, and suppliers

Table 3: Rotated Factor Loading supply chain performance Efficiency

Items No:		Components
Efficiency		
Effe3	Percent of orders shipped on time	.857
Effe2	Percent of orders that are delivered on time	.821
Effe4	Percent of shipments requires expending	.818
Effe1	Percent of orders shipped to customers from the primary location designed to serve those customers	.726
Effe6	Average order cycle time (time in day between order receipt and order delivery)	.711
Effe5	Inventory turn per year	.681

Descriptive Analysis of supply chain management practices: Table 3 shows the means and standard deviations of the five dimensions of supply chain management practices: integration, information sharing, Customers management, Suppliers management and speed of communication. The table reveals that the Sudanese industrial companies emphasized more on speed of responsiveness (mean=3.722, standard deviation=1.176), followed by supply chain integration (mean=3.713, standard deviation=1.080), and then information sharing (mean=3.52, standard deviation=1.123) and followed by Customers management (mean=3.430, standard deviation=1.313) and the lowest components of supply chain management practices is suppliers management (mean=3.262, standard deviation=1.084). Therefore those five dimensions achieved an average score of (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 (3). In addition supply chain performance efficiency as showed that the mean and standard deviations of the dimensions: Efficiency the table reveals that Sudanese industrial companies emphasized more on efficiency (mean=3.546, standard deviation=1.0. Given that the scale used a 5-point scale it can be concluded that Sudanese industrial companies have highly supply chain performance efficiency oriented above the average mean

Correlation Analysis: Table 4 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 Table 4 shows that integration is positively and significantly correlated with supply chain performance efficiency (r = .411, p-value < 0.01), Information sharing is significantly correlated with supply chain performance efficiency (r = .363, p-value < 0.01), with speed of responsiveness is positively and significantly correlated with efficiency (r = .315, p-value < 0.01).

Table 4: Person's Correlation Coefficient for All Variables

Variables	mean	St.deviation	W1	W2	W3	W4	W5	X1
Supply chain practice W1integration	3.71	1.0	1.00					
W2 information sharing	3.52	1.1	.476**	1.00				
W3 customers management	3.43	1.3	.345**	.317**	1.00			
W3 suppliers management	3.26	1.0	.413**	.245*	.306**	1.00		
W5 Speed of communication	3.7	1.1	.538**	.381**	.296**	.369**	1.00	
X1 supply chain performance efficiency	3.5	1.0	.411**	.373**	.187	.141	.315**	1.00

The Relationship between Supply Chain Management Practices and supply chain performance Efficiency

Table 5 shows the results of the hierarchical regression equation testing the influence of the supply chain management practices variables on efficiency. the supply chain management practices variables explained 71.087% of the variance in efficiency. However, the result shows that the model is significant. In addition the results show that all the five component of supply chain management practices were positive influenced efficiency. The results showed that the hypothesis was supported, i.e. there is a positive relationship between supply chain management practices and efficiency

The results also showed that integration have the most significant effect on efficiency ($\beta=0.225$, $p<0.01$), followed by information sharing ($\beta=0.214$, $p<0.01$), followed by speed of responsiveness ($\beta=0.116$, $p<0.10$), and suppliers management ($\beta=-0.058$, $p<0.56$),lastely comes customers management ($\beta=0.027$, $p<0.78$), These results give support to hypotheses H1.1a (integration and efficiency), H1.1b (information sharing and efficiency), and H1.1c (speed of responsiveness and efficiency), H1.1d (suppliers & management and efficiency). H1.1e (customers' management and efficiency). 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 efficiency.

Table 5: Multiple Regressions: supply chain management practices Variables, and supply chain Efficiency (Beta coefficient)

Variables	Efficiency
Integration	.225**
Information sharing	.214* *
Speed of responsiveness	.116*
Supplier s management	-.058
Customers management	.027
R ²	.178
Adjusted R ²	.217
ΔR^2	5.637***
F change	.225**
	.214*

Note: Level of significant: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

DISCUSSION

One of the most interesting findings in this study indicate that there is positive relationship between supply chain management practices and supply chain performance efficiency the result show that integration have significant effect on efficiency this result aligns with (Zailani, and Rajagopal 2005) Most companies seek to work more efficiently because the efficiency associated with optimal use of resources and output While it is a priority that successful integration of the supply activity with what customers demand leads to delivery of high quality products, on time, and at low cost that may lead to supply chain efficiency accordingly Kim (2006) analysis results in large firms, the infrastructural role of SC integration which drives the strong interrelationship between SCM practice and competition capability is stressed. And, based on such high level of SC integration, more close interrelationship between SCM practice and competition capability and more significant direct effect of these constructs on performance might be possible.

According to the results the information sharing have significant effect on efficiency this result aligned with Sakka1, and Botta-Genoulaz (2009) The result of this study shows that both effective information sharing and effective supply chain practices are necessary to achieve improvement in supply chain performance, and have significant influence on delivery performance and according to Zhou, and Bentley. (2007) information sharing Play different roles in managing supply chains. To improve supply chain performance, Tan(2001) mentioned that information sharing is crucial to efficient operation everywhere along the supply chain to every function this are also according to the

previous study (Lazarvec. et al. 2007).also the speed of responsiveness have significant effect on efficiency The efficiency requires , responsiveness speed and delivery of products at the right time to achieve a degree of efficiency in the operating and also the efficiency requires cost reduction that can achieved it by lead-time reduction as (Lazarvec. et al 2007). Argue that corporations need to develop four capabilities in today's business environment: forecasting, inventory planning, supply chain speed, and data accuracy. These capabilities form the business foundation required to adapt to having the right product in the right place at the right time and at the right price, Lastly suppliers & customers relationship management have no significant effect on efficiency this result aligns with (Christopher, 1992) study. 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, performance competitive advantage emerges from the creation of supplier competencies to create customer value and achieve cost and/or differentiation advantages, To obtain that, 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).also companies Managing the relationship with suppliers and customers aimed to achieve high inventory turnover this can be achieved by effectively implementing IT in all operational activities because of the Sudanese manufacturing firms suffer from the weakness of IT infrastructure and the un stability of economic environment lead to the lack of continuously relationship between firms and suppliers, customers so this may reduce the effect of suppliers and customers

management on Sudanese manufacturing firms supply chain performance efficiency. This study has provided empirical justification for a framework that identifies five dimensions of SCMP and describes the relationship among SCMP and SCP within the context of manufacturing sector in the Sudan. Previous studies supporting the importance of SCMP mostly used and relate SCMP to organizational performance and not with SCP. The major contribution of this study is the development of a dimension of SCMP constructs through comprehensive combination perspective, 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, efficiency SCMP have important implications for SCP.

This study offers a number of managerial implications. First, this study will help decision makers in companies to know the importance of SCM practices and how SCM practices influence the supply chain performance efficiency. Therefore, decision makers should focus on improve their SCM practices. Second, the analysis of data also indicates that SCMP might directly influence on supply chain performance. Theoretically, The study shows that the validated SCM practices are applicable to developing countries such as Sudan also the study offers empirical evidence suggesting that even in the medium business the better SCMP can lead to good performance. Moreover This study contributes to the literature by empirically examining the relationships among SCM practices and Supply chain performance

This study has some limitations one of these limitations is the use of only one respondent per company, which might be a cause of possible response bias. Thus, caution should be taken in results interpreting. Future

research should endeavor to collect data from multiple members across the supply chain. Also, this study depend on a questionnaire survey at one point time the of time or changes may be occurs. The sample size should be considered, the conclusive evidence reported in this study is also from industrial sector in Sudan.

Through these limitations which mentioned future research should focus on developing supply chain management practices dimensions, Also should focus on measuring new dimensions of supply chain performance

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