

Articles Review on Forward and Reverse Supply Chain/ Closed Loop Supply Chain Practices

Diriba Ayele Gebisa

Department of Business Management
Hariyana School of Business, GJUST, India
E-mail: dirayele@gmail.com

Abstract

Despite the increasing popularity of research in supply chain management significant number of research focused on forward supply chain management by neglecting one of the most important part of supply chain that is reverse supply chain management, which complete supply chain management as closed loop. Large numbers of prior research consider only one variable at a time to see performance of forward or reverse supply chain on organizational performance. However, supply chain performance is the function of different combination of variables. Therefore, this paper review the effects of transportation, inventory management, facility location and information sharing in closed loop supply chain practices on organization performance.

Keywords: Forward supply chain, backward supply chain, closed loop supply chain.

I. Introduction

For a long period of time companies tried to be competent by operating alone assuming working and sharing information with other partners in the supply chain and competitors erode their profitability by exposing their source of competitive advantage to competitors. These fault assumptions become bottleneck for all supply chain partners from enhancing their efficiency and effectiveness. To overcome these fault assumptions and to reap the lost opportunity by practicing effective and efficient supply chain practices, firms had started to practice supply chain practices by closely working with suppliers, marketing intermediaries and consumers.

The origin of supply chain management goes back to the 1940s and 1950s when logistics was stressed on how to use mechanization to improve the very labor intensive processes, while 1980s marked the beginning of a change in the history of supply chain management and the term supply chain management was introduced first time by consultants in the early 1980s (Oliver and Webber, 1992). The logistics boomed in the 1990s by the emergence of Enterprise Resource Planning (ERP) systems and the term supply chain management got widespread recognition as a result of the globalization of manufacturing since the mid1990s (Council of Supply Chain Management Professionals, 2005). The intensified competition in the 1990s and globalization of the markets forced the whole supply chain partners for fundamental collaboration of supply chain partners (Gligor, Holcomb, Gligor, & Holcomb, 2012) and that is why firms had integrated their physical distribution and logistics functions into the transportation and logistics perspective (Tan, 2001; & Childerhouse, Aitken, & Towill, 2002). Georgise, Thoben, & Seifert, (2014) also stated that firms forced to adopt and use supply chain practices for the reasons they failed to upgrade and overcome pressure from globalization through improving their own operations using techniques of Total Quality Management, Enterprise Resource Planning, Business Process Reengineering and Lean Technology. All these issues pushed the development of supply chain management.

From thorough overview of supply chain management literature large number of former studies examined only one directional flow of supply chain management that restrict optimality of supply chain practices. However, Pishvae and Torabi, (2010) described forward and reverse supply chain as interdependent activities where one cannot fully succeed without the other. Therefore, to overcome the limitation of one directional flow and for optimality of the supply chain management practices this paper focused on bidirectional flow of supply chain management.

Forward logistics are all functions within and outside a firm that support the value chain system to make and offer products to the customer (Cox, Blackstone, Spencer, 1995); and the network of entities through which material flows by adding certain value for each partners (Lummus and Alber, 1997). Later on reverse supply chain or reverse logistics has started to attract the attention of increasing numbers of scholars and experts for the rising concern of sustainable growth, environmental concern, government legislation, corporate social responsibility, rising of products return, and high competition among firm. Reverse logistics is activities of designing, implementing and controlling the reverse flow of goods or end of life products and package of the products from consumption centers back to initial manufacturing center or to the centers of proper disposal (De Brito and

Dekker 2002); and process of actions by which a manufacturer collects back products and its components for effective reusing, rebuilding, or disposing purpose (Dowlatshahi, 2000).

Significant number of past review literature focused on forward logistics practices and its benefits and only limited number focused on reverse supply chain practices and its benefits on performance. There is total absence of review that integrated both forward and backward supply chain practices on organizational performance from the angles of major variables of supply chain practices such as facility location, transportation, inventory management and information sharing on economic, marketing, environmental and corporate social responsibility performance of an organization.

Therefore, this study reviews literature related to facility location, transportation, inventory management, and information sharing on the forward and reverse supply chain performance from four dimensions of performance measures; including environmental, economic, marketing and corporate social responsibility aspects. The rest of this paper is organized as follow: the first section reviews the evolution of bidirectional supply chain/ forward and reverse logistics. The second section deals with evolution supply chain management; the third section examines detail definitions of forward and reverse logistics from different. The fourth section examines supply chain practices from view of facility location, inventory management, transportation and information sharing in relation to forward and reverse supply chain practices; the fifth section discussed the supply chain performance and its measurement from the view of marketing, environmental, and economic performance subsequently. The final section summarizes all the discussion made and concludes by proposing direction for future research.

2. The evolution supply chain management

The origin of supply chain management goes back to the 1940s and 1950s when logistics was stressed on how to use mechanization to improve the very labor intensive processes. The intense global competition of the 1980s forced world class organizations to offer low cost, high quality and reliable products. The 1980s marked the beginning of a change in the history of supply chain management; it was the time when the term supply chain management was introduced for the first time by consultants in the early 1980s (Oliver and Webber, 1992).

The intensified competition of the 1990s and globalization of the markets forced the firms to be flexible and responsive to sustain an effective competitive edge (Chan et al., 2003; Li et al., 2006); and the development different philosophy also contributed their parts for the success of supply chain management activities. The extensive review of supply chain management literature shows that different philosophy, techniques and technology such as JIT, TQM, lean, agile, Total Quality Management, Enterprise Resource Planning, and Business Process Reengineering had practiced to overcome the market challenge of the time, however failed to overcome by improving their internal operation and at the same time meeting the market demand (Georgise, Thoben, & Seifert, 2014).

JIT is a philosophy that advocates the elimination of waste and improvement of quality by cutting non value adding activities or parts (Harrison and Hoek, 2011); and JIT technique aims inventory optimization by reducing or eliminating holding of excess inventory (Sungard, 2007). JIT and SCM is not totally two different unrelated techniques, but they differ in their scope and the way they tried to achieve the objectives. JIT focused on process improvement while SCM focused on integration throughout supply chain for quality improvement. Similar to JIT philosophy, TQM is an approach of using different principles and practices to meet and delight customers besides the ultimate objectives of quality improvement. TQM support SCM in achieving its objective by improving product quality, customer satisfaction and achievement competitive advantage; and TQM also reduce process variance, that affect cycle time and delivery dependability of supply chain performance (Flynn et al., 1995).

Another, practices that supported the development of SCM includes: the lean supply chain management. Lean is an approach of internally value adding through automation and JIT is technique of waste reduction, customers' satisfaction and profits (Taiichi Ohno, 1998). However, the lean supply chain failed on external responsiveness (Vonderembse et al., 2006); and unable to act in the highly flexible and changing environment (Reichhart & Holweg, 2007). However, Lean supported SCM in achieving its objectives through minimization of inventory cost, improvement of customer satisfaction and making profit from satisfied customers. Similar to Lean, the concept agility in supply chain management started to overcome the drawback of lean approach. Philosophy of agility focused on continuous respond to the market requirements. The agile supply chain is an approach to respond rapidly and cost effectively to unpredictable and changes in markets (Agarwal et al., 2007; Christopher, 2000).

Enterprise resource planning is another significant system that supported the success and development of supply chain management. An ERP system is configurable information systems packages that integrate information and information-based processes within and across functional areas in an organization (Kumar and Van Hilleberg 2000). To enables supply-chain partners to work in close coordination with their supply chain partners they need information sharing to facilitate supplier-customer interactions and minimize transaction cost (Lawrence, 1999; Lee and Whang, 2000). Therefore, supply chain partners need to integrate their business process through ERP to enhance communication and cooperation among functional departments; and firms. Finally, the introduction of recent concept of green supply chain management broadened and advanced the scope of supply chain management for emergence of reverse supply chain. Green supply chain is a philosophy that enables

firms to consider multi objective at a time; profitability objective, environmental risks and ecological efficiency (Zhu et al., 2008).

Generally, the development of supply chain management started with the distribution management in the 1970s when organizations focused on to reduce inventory and distribution costs without any coordination among functional units. Then after, in the 1980s firms started to reengineer organizational cost structures to form an integrated logistics management in the 1980s through coordination among functional units and achievement of organization wide objective. Further, the increased global completion in the 1990s caused supply chain management with strong coordination among several independent companies to reduce cost & redundancies, and to create higher customer value. Finally, early 21st century environmental and social concerns pushed supply chain management to broaden its scope to be sustainable supply chain by behaving in a social and environmental responsive way by including the interests of all stakeholders, society, and government.

3. Definition of forward and reverse supply chain management

3.1 Definitions of Forward Supply Chain management

There are no clear cut definitions of forward and reverse supply chain management; however the core concepts of all definitions are same. To make the study more manageable and meaningful this paper will discuss some of the relevant definitions of forward and back ward supply chain management. Traditionally everyone can consider the term supply chain management as forward supply chain management neglecting the reverse supply chain management. However, the true concepts of supply chain basically represent forward supply chain and backward supply chain management.

In the definitions of forward supply chain management, researchers can interchangeably use the term traditional or forward supply chain. The definition of forward supply chain management is given by different authors from diverse perspectives; however the core meaning of all the definitions encircled around the same topic. To start from the earliest definition of forward supply chain, Lee and Billington, (1995) point out that forward supply chain as set of activities that connect together all supply chain partners from suppliers of inputs from upstream to consumers in downstream of supply chain network; Cox, Blackstone, & Spencer (1995) defined forward supply chain as all functions within and outside a firm that support the value chain system to make and offer products to the customer. Similarly, Schary (2001) defined forward supply chain as activities that deal with the smooth flow of raw materials, finished products and information within supply chain network starting from suppliers to final consumers; and Chopra and Meindl, (2010) indicated forward supply chain as combination of activities to be undertaken by suppliers, producers, carriers, agent, wholesalers, retailers to fulfill demand of customer

Other scholars also defined forward supply chain as network. Among the definitions given from the perspective of network; Lummus and Alber, (1997) defined forward supply chain as the network of entities through which material flows by adding certain value for each partners; although Tan (2001) defined forward supply chain as a network relating to two environments; internally within an organization, and externally along the supply chain partners. From all these definition, one can observe that the classical supply chain management only focused on the way to better serve customer requirement and generate financial benefit, regardless of no considerations for corporate social responsibility and environmental concern.

Generally, forward supply chain management defined from variety point of view; for example from resource utilization view, forward supply chain management is a system of effective utilization of resource, technology, coordination of the manufacturing and logistics achievement for competitive advantage, Ferrell, Rogers, Ferrell, & Sawayda, (2013); and Mentzer and et al., (2001) viewed forward supply chain as systematic and strategic decisions of organizing the traditional business functions within an organization and across supply chain partners for improving profitability of an organization.

3.2 Definitions of Reverse Supply Chain management

Competition in the business environment, government legislation, and environmental concern has forced firms to shift from simple un-directional supply chains to sophisticated bi-directional supply chain. In contrast to forward supply chain, reverse supply chain focus on the reverse flow of raw materials, finished goods and information for different purposes. Just like forward supply management, reverse supply chain management defined from different point of view, but all the given definitions compromise on the core meaning of the concepts. From the extensive review of prior researches, the definitions of reverse supply chain are organized as follows:

The first perspective is functions of management. Rogers and Tibben-Lembke, (1999) defined reverse supply chain as the process of planning, implementing and controlling the efficient and cost-effective flow of raw materials, in process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing or creating value or for proper disposal. Similarly, De Brito and Dekker, (2002) defined reverse logistics as activities of designing, implementing and controlling the reverse flow of goods or end of life products and package of the products from consumers back for recycling or for proper disposal.

The forward supply chain management is also defined as activities of bringing back end-of-use products that no longer serve the consumers for recapturing value by recycling or safe disposal of harmful products (Fleischmann et al., 1997). Also,

Dowlatshahi (2000) defined reverse logistics as a process of actions by which a manufacturer collects back products and its components for effective reusing, rebuilding, or disposing purpose. Similarly, Carter & Ellram, (1998) defined reverse logistics as a process of returning back the product or its package to reuse, recycle, or for safe disposal.

Generally, the definitions of reverse supply chain given by different scholars have closely the same meaning. For example, Pokharel and Mutha (2009) defined reverse logistics as management of used products, discarded products, excess inventory for recycling or recovery of value; reverse logistics is all actions related with product and materials reuse through collection and processing of used products to maintain sustainable environment; and Murphy and Poist (1988) referred as activity of taking back products from customers for different purposes.

4. Supply Chain Practices

This section deals with review of both directional logistics practices, i.e forward logistics practices and reverse logistics practices. Logistics is one part of supply chain management practices that impact competitive advantage and overall organizational performance. Supply chain management practices are a set of activities undertaken in an organization to promote effective management of its supply chain. A well-managed logistics practices are expected to improve supply chain performance through cost, quality, delivery dependability, time to market, and product innovation (Fernie, & Mckinnon, 2011). Logistic became very important sector for the international sustainability of the companies. If a logistic company works with high performance, it will create competitive advantage for both the company and country (Akdoğan & Durak, 2016). The idea of logistics and supply chain management is an interaction of different processes and functions within a firm's network for the purpose of cost reduction and customer satisfaction (Bichou & Gray, 2007).

Logistics is a multi-dimensional practice. It is a process of planning, implementing, and controlling the efficient and effective flow and storage of goods and related information. At the same time logistics deal with selection and arrangement of vehicles for transportation of materials and finished goods, and handling/holding of inventory in warehouse/storage until needed for production/consumption. An effective logistics practices shorten procurement time; minimize stock maintenance costs and shipment cost and time, offer secured and reliable services (Onay & Kara, 2009; Aziz, Hillegersberg, & Kumar, 2010). The components of logistics are so broad but based on its relevance only four broad factors affecting both forward and reverse logistics practices covered in this study including inventory management, facility locations, transportation and information sharing.

4.1 Transportation

Transportation plays the key role in moving and integrating people and raw materials. Transportation activities have the potential to integrate and improve the overall national and international economic growth through supply chain linkages by making the products available from the surplus area to shortage area. Effective and efficient transportation also improve the perceived value of particular firm's products by making easily available everywhere, and offering faster delivery. The scope of transportation issue is comprehensive and complicated. A transportation issue includes decisions relating to selections of the right modes of transportation minimization of transportation cost and time, shortening lead time, loading time and unloading time for on time delivery, flexible delivery, and overall customer satisfaction.

From variety of transportation system, this paper focused on freight transportation segment since it play a significant roles in coordinating and integrating all the supply chain partners from upper stream to lower stream in forward supply chain and its reverse in backward supply chain practices. Freight transportation is the key component in integrating supply chain partners by extracting raw materials and moving to producers; and move finished products from production site to consumption center; and reverse back fault products, excess inventory or defective products from mass consumption to manufacturers for desired purposes. Freight transportation support flow of commodity in the global market and supply chain partners from extraction of raw materials to distribution of final products to market (Nijkamp 2003).

Transportation issue is one of the most important topics in closed loop supply chain practices since without efficient and effective means of transportation it is not possible to achieve the ultimate objective both in forward and reverse supply chain practices. Effective means of transportation make raw materials and finished goods to be available at the right place and right time for manufacturers, distributors and consumers. The main actors in the transportation systems are shippers and carriers. As Friesz, Gottfried, and Morlok (1986) specified the difference between shippers and carriers; shippers are entities that desired specific products to be arrived at a particular destination, whereas carriers are entities that move the products for shippers at profit. The movement of raw materials, and finished goods in the forward flow; and defective products or end of life products in the reverse flow takes place either through private carriers or public carriers. Every carrier use different modes of transportation, including road, rail, air water, and pipe lines (Chopra & Meindl, 2004).

The mode of transportation is an important consideration when desiring certain target level of supply chain performance. Besides costs, the urgency of the shipment, the value of the goods to be shipped as well as the physical size and weight of the goods to be transported need to be considered when determining the mode of transportation. Transportation mode compounded with uncertainties that seriously affect performance of supply chain (Sheu et al., 2005). The most important

consideration in the selection of a particular mode of transport is its cost since nearly one third of the total cost of logistics operations is transportation cost (Alan, Phil, & Peter, 2006). Similarly, another study show that a one third to two third of the expenses of enterprises' logistics costs are spent on transportation and the cost of transportation on average account 6.5% of market revenue and 44% of logistics costs and a fall in transportation cost by one unit leads to inventory costs to be dropped in triple and similarly (Wilson, 2004).

The right mode of transportation is the modes that results the shortest time and minimum cost path between source and consumption point. Transportation model have a critical impact on supply chain performance since the adopted modes of transportation affect reliability and dependability on the mode, quality of service to be offered, capacity to be loaded, delivery time, and cost of transportation.

In freight transportation the main concern is cost minimization. As Swenseth & Godfrey (2002) stated transportation costs account nearly half of the total logistics costs that need consideration. In operation research large numbers of researchers employed different model with objective function of cost minimization. The popular model frequently used include North West Corner method, stepping stone method, and least cost method under the assumptions of certainty of unit cost of transportation, and certainty of demand and supply capacity of every sources. The right path with minimum cost (Ben-Tal et al, 2011; & Safer et al., 2014), minimum time (Yuan and Wang, 2009) and minimum risk of transportation (Safer et al., 2014), and minimum loading and unloading time (Barbarosoglu et al., 2002) enhances the overall performance of the firms. Mason, & Lalwani, (2007) also concluded that transport highly affected by inefficient loading and unloading, capacity loss, infrastructure loss, and congestion loss.

Another factor to be considered under the shade of transportation is the lead time. Lead time is a time between placements of an order to acceptance of product ordered. It is a function of order processing time and time to be taken by carrier on delivery. Lead time reductions improve speed of delivery (Treville, Shapiro, & Hameri, 2004). Unexpected delays at loading or unloading points, failures within the distribution network and unforeseen situations negatively affect efficiency of supply chain management (Stajniak, Hajdul, Foltynski, & Krupa, 2008). An increase in average lead time increase delivery time, decrease customers dependency and reliability that negatively affect overall supply chain performance.

Generally, sustained and effective freight transport is fundamental for the economic development, where transport cost and supply chain performance is highly correlated (Kuse, Endo, & Iwao, 2010). Kotler & Wong, (n.d.) also specified a progresses in physical distribution yield great improvement in supply chain performance. Therefore, an effective mode of transportation has the potential to reduce cost of a product, facilitate economic growth, and satisfy customers by making available the products at the right place and right time.

4.2 Facility Location

Regardless of the nature of their business all types of organization's objective is to satisfy and delight customers with its product and services. Achievement of this objective highly based on location of the facility such as warehouse/storage, and plant location from suppliers', distributors and consumers. As Krajewski, (2007) defined facility location decision as the process of determining the right geographic site for a firm's operations. Decision of facility location is one of the critical issues that need strategic decision making in supply chain management practices. This decision plays a critical role in the efficiency of closed loop supply chain management since facility location can be a vital importance for limiting production capacity, for expansion to new market, and for cost minimization (Thanh, Bostel and Péton, 2008).

The basic issues to be answered in the facility locations are where to locate and how to size facilities? How to meet customer demands from the facilities? Which facilities serve each customer? How much customer demand is met by each facility? Different researchers proposed different model with the objective of minimization or maximization, or combination of these in forward and reverse supply chain. As Boonmee, Arimura, & Asada, (2017) stated many researchers used facility location model with an objective of cost minimization besides maximization of consumers satisfaction.

In closed loop supply chain management selecting and fixing the right location at different hierarchy on the basis of cost, distance, time, and accessibility of the location needs strategic decision making. Effective and efficient movement from upper stream to lower stream in the forward flow needs the right location for ware house and storage to be arranged for storing raw materials until required in the production process and finished goods until distributed to wholesalers or agents at the manufacturers' levels. Similarly, warehouse needed to be located in the right place at the distributors' and retailers level until needed to be resold by wholesalers to retailers or retailers to consumers. In the same way, for the backward movement of end of life products from downstream to upper stream, proper site for warehouse establishment is highly needed in the reverse logistics due to complexity of the process than forward logistics.

In reverse logistics facility location decision is more complicated and challenging than forward logistics since forward logistics is more formal and well integrated than reverse supply chain. In forward supply chain the distribution is from single or few manufacturers' to many distributors, then to large numbers of consumers. Therefore, distribution of products in forward logistics is less complicated and simpler than reverse logistics. However, in reverse logistics the end of life products movement for remanufacturing, repairing or for proper disposition requires collection of variety of end of life products from large numbers

of consumers located in different locations back by few individuals with limited capacity to few local storage and then forward to far located manufacturers. Therefore, for the smooth flow and cost effectiveness of all these activities locations of the networked facilities have significant impact (Wang, & Yang, 2014).

The need for highly dealing with facility location decision in the supply chain management and considering the issue as part of the firm's strategic issue is for the long-term impact of the decision on the firm performance. Facility location influence efficiency of supply chain management by influencing inventory level and cost, delivery cost and time, and for quick response to customer request. Research shows strong relationship between location problem and inventory (Shen, Kremer, Ulieru, and Norrie, 2003) and the existence of linear relationship between transportation cost and location (Shen and Qi, 2007). Generally, for right locations decisions there is a need to consider availability infrastructure, raw materials, nearness to consumer, and availability of cheap and skilled labor to offer quick service delivery at minimum cost and to offer quality service to improve supply chain performance.

4.3 Inventory control

Inventory is the unused raw materials, working process inventory or finished good kept in storage or warehouse for future consumption, reselling or further processing. Inventory is an integral and essential aspect of supply chain decisions. Therefore it needs reasonable management. As Jessop (1999), inventory management is an art and science of maintaining optimum level of stock at the least cost without negatively affecting other objectives, and Stevenson (2010), also defined inventory management as a framework to be employed by organizations in achieving interest in inventory. It is an operational planning of holding optimum level of inventory for overcoming shortage and excess inventory. Holding optimum level of inventory enables a firm to satisfy customers by fulfilling the order to be placed immediately.

The ultimate objective of inventory management is to increase organizations' profitability by reducing total logistics costs through better inventory management and better customer services (Gourdin, 2008). In logistics activities having optimized inventory levels within the company and across all supply chain partners are crucial decision since inventory management influence firm's basis of competitive advantage as quality and delivery of customer orders on time (Gunasekaran, Williams, & McGaughey, 2005); and Wang & Zhang, 2010). Effective inventory management is very critical for success of supply chain performance. Vast majority of supply chain literature is concerned with minimizing operation cost or maximizing profit but research on effects of inventory management on performance of supply chains has only recently received significant attention (Melo et al., 2009). Effective reverse logistics increase customer satisfaction by allowing the firms to hold optimal inventory and minimum distribution cost (Sarkis and Talluri, 2004; and Mollenkopf et al., 2007).

Efficient inventory management in supply chain reduces the operating cost and improves level of customers' services Cetinkaya and Lee (2000). The alternative system for reducing level of inventory in the supply chain is the adoption and implementation of transshipment policy. Transshipment is system of replacing inventories from nearer warehouse locations rather than filling the order from upper and far location to reduce lead times Schwarz (1989); and other similar finding made by Grahovac and Chakravarty (2001) also show inventory holding costs and waiting costs of inventory reduced by inventory sharing and lateral shipments. Inventory management need to consider the tradeoff between holding and ordering inventory cost and the opportunity cost of the stock out. For the optimum operation of supply chain performance the tradeoff these costs needs management. The common inventory management techniques to be seen in this paper are: economic order quantity (EOQ), just in time technique, vendor managed inventory and ABC analysis.

EOQ determines the optimum order quantity that minimize the variable inventory costs., i.e annual holding cost and ordering cost for replenishment of an inventory Chopra & Meidl (2001); EOQ levels minimizes the balance of cost between inventory carrying costs and re-order costs Schroeder (2000); EOQ balance conflicting cost of holding and placing a new order for replenishment orders; EOQ estimate the economic order quantity by balancing the two conflict costs Schaidler (2001), and EOQ finds the quantity that minimizes the sum of the two variable costs of inventory Lyson & Farrington (2006). Therefore, the EOQ of inventory management technique enable an organization to know rationally when to place an order and how much to order Bowersox (2002).

The JIT is another technique of inventory management. It is a philosophy derived from Japan to refer to an operations system in which materials are delivered just as the order placed. JIT technique defined as the uninterrupted flow of 100% acceptable materials delivered on the right time. The implementation of a JIT inventory system requires a full facility, strong capacity and long-term relationship with suppliers in order to fill order as soon as it placed.

The third technique inventory control technique is ABC analysis. ABC analysis is a classical approach to categorize inventory items as A, B, C category based on their economic value (Gupta, Jain, & Garg, 2007). The ABC analysis only got management attention for control on the basis of their economic value irrespective of the necessity of the items.

Generally, for a better supply chain performance an effective inventory management is essential since inventory account large percentage of assets of an organization. Therefore, while designing a warehouse attention should be given to ware house design, size and location to reduce transportation cost, holding cost, spoilage cost, insurance cost and leading time. Similarly, during the warehouse design as James, Tompkins, Jerry & Smith (1998) stated considerations should be made to: effective

utilization of the space, loading and unloading areas, and equipment required to perform certain processes, flexibility of moving products within the warehouse facility and protection of the items from damaging.

4.4 Information sharing

The scope of information technology is widening starting from the early introduction of computers. In the early 1950s information system was considered well for technical and a few technicians running; in the 1960s & 1970s information system mainly used for managerial control purpose only, and in the 1980s and 1990s information technology started to be used for running the institutional core activities. Late 1990s information technology started to integrate the whole company through supply chain management.

At this time the trend of business are changing and every industry are continuously attacked by new technology, new tools and new methods of doing business. Therefore, company needs to invest huge capital in hard ware and software by purchasing and training people for data collection, processing and sharing right quality and quantity of information in the supply chain. The smooth flow of information is the heart of efficient and effective supply chain coordination and integration. Communication can fasten and integrate the supply chain partners to work together as a unit rather than as an individual. Also, information can help an organization to achieve competitive advantage and improve their performance.

The role and impact of information sharing broadly studied in supply chains management (Li et al., 2005; Fawcett et al., 2007; Yang & Maxwell, 2011; Lotfi et al., 2013). However, gathering, processing and dissemination of right quality and quantity of information in the supply chain require high cost of investment for technological facility and expert, this discourage extended information sharing within supply chains (Fawcett et al., 2007). Therefore, there is a need to significantly consider the information quality due to the constraints that affect information quality and quantity (Naumann, 2001).

The emergence of new thinking in managing supply chain partners has been largely facilitated by developments of information technology supported techniques (Mason et al., 2007). To work closely in supply chain, supply chain partners need information sharing, where strong supply chain integration achieved through information sharing (Lotfi, Sahran, Mukhtar, & Zadeh, 2013) and strong supply chain integration make dependable and quick delivery of product. Information sharing has quantity and quality aspects and both aspects are important for the efficiency of supply chain management (Moberg, et.al 2002). Quantity aspect refers to the extent to which critical and proprietary information is communicated to one's supply chain partner (Monczka, Petersen, Handfield, &, Ragatz; 1998). Information to be shared vary from long term plan at strategic level to short term plan at operational level or from information about logistics activities to general market and customer information (Monczka, et.al; 1998). Supply chain partners who exchange quality information at regular time are able to work as a single entity by fully integration (Sukati, Bakar, Baharun, & Yusoff, 2012). Further, smooth flow of information in the supply chain enables partners to collectively understand the needs of the end customer better and to respond to market change faster (Childhouse and Towil, 2003).

Similar to the amount of information, quality of information is another aspect of information for decision maker. Quality of information measured from the dimension of accuracy, timeliness, adequacy, and credibility of information (Monczka. et.al; 1998). Also, the quality of information is measured from the aspects of its impacts on efficiency of supply chain (Chizzo; 1998).

The qualities of information in supply chain management affected by the divergent interests and opportunistic behavior of supply chain partners, and information asymmetry across supply chain. Sometimes the firms intentionally distort the quality of information due to the perception of information disclosure as takeover of market opportunity by competitors (Mason-Jones, Towill; 1997); and Feldmann, & Müller, (2003) marked ensuring the quality of the shared information becomes a critical aspect of effective supply chain management due to perceived assumption of information disclosure on firms. Generally, Ketchen et al., (2008), highly pointed the potential of innovation and time from information technology in creating sustainable competitive advantage as the next key areas of competitive advantage than the traditional basis of competitive advantage. Therefore, it is essential for supply chain partners to view information as a strategic asset for foundation of competitive advantage by improving performance, market responsiveness, better customer relationship and customer satisfaction.

5. Forward and Reverse Supply Chain performance and Measurement

In this section of this paper, performance measures and metrics for both forward flow and reverse supply chain discussed on the basis of past research result. Performance measurement is frequently discussed issue nevertheless hardly defined. The idea of measuring the supply chain performance emerged a long time ago; however only few supply chains are often managing performance measurement in critical supply chain contexts (Gunasekaran & Kobu, 2007). Performance measurement is the systematic way of quantifying the productivity of resources emption system.

Companies can measure their supply chain performance for variety of reasons. Some measure to increase consciousness, relationship and integration among supply chain participants (Cuthbertson & Piotrowicz, 2008); and others measure performance to check whether arrived on planned objectives or not, for controlling purposes (Lohman, Fortuin, & Wouters, 2004). Controlling is one of the management functions that use performance result as inputs for controlling functions since

controlling is function of comparing predefined desired performance against actually measured performance result. Therefore, performance measures and metrics is a core activity for evaluation or comparison. As (Tetik, 2003) indicated performance is a degree of achievement attained by an enterprise within a specific period, whether expressed in quantitative or qualitative way. Also, supply chain performance measurement offer sufficient information concerning finance, innovation and improvement of a system for internal and external stakeholders (Fawcett & Magnan, 1996).

In all types of firms the primary basis of performance measurement is the objective of the organization. Therefore, just like other firms, firms in forward and reverse supply chain practices measure their performance on the basis of their predefined objectives. Supply chain performance measures broadly classified as: qualitative and quantitative; or financial and non-financial measures. Traditionally the focus of an organization is profit maximization by revenue expansion and cost minimization. Therefore, in the early period supply chain performance is more measured and expressed by financial instruments, but criticized for its drawback to measure the important non-financial measured performance. However, today to overcome the drawback of financial measurement basis alone, multi-dimensional measurement is adopted by incorporating non-financial performance metrics (Basat, 2010).

The advanced multi-dimensional performance measure proposed by different scholars to measure supply chain performance from different angles include, cost, activity time, customer responsiveness and flexibility identified as supply chain performance by Beamon, (1998); customer service and flexibility Beamon, (1999); delivery reliability, responsiveness, cost reduction, lead times, conformance to specifications and process improvements and time-to-markets (Panayides and Lun, 2009) and delivery time, quality consistency, productivity, production time, delivery, service quality, flexibility, market share, customer loyalty, efficiency and conformance to standards (Morgan et al., 2009; & Aziz et al., 2010), and delivery cycle, delivery speed, dependability on supplier, manufacturing lead time, quick confirmation of orders, quick customer complaints handling, and frequency of new product development proposed as performance measurement instruments (Jayaram et al. 1999).

The impact of the traditional/forward supply chain practices on organization performance studied by so many researchers as discussed above; from the financial, non-financial, operational, and marketing point of view. However, the studies made on the effect of reverse supply chain practices on organizational performance were very limited. On the other hand, the scope of the reverse logistics effect on organizational performance is seen from broader perspectives; in addition to the forward logistics perspectives include environmental, legal, and corporate social responsibility point of view. However, the dimensions of performance measurement of supply chain practices are difficult to be specified and measured due to the overlapping nature of the items of performance measure. Among the other dimensions, items for measuring firm performance do often overlap; items for measuring financial, economic and marketing performance pooled together and studied under economic performance (Rao, 2002; Rao and Holt, 2005); and profitability, cost savings and market share under economic performance (Giovanni, 2012; Zailani et al., 2012). Therefore, items may belong to more than one dimension depending on perception of the individual and to overcome the problem of the measurement dimensions, this paper only focused only on three broad scopes, including marketing, economic and environmental scopes of performance measure of an organization.

From the review of the past studies, yet no agreement made among researchers regarding the impact of reverse logistics on organizational performance, (Zhu et al., 2005; Hazen et al., 2011; Zhu et al., 2012; Green et al., 2012a). Some researchers say, reverse logistics have significant positive relationship with organizational performance (Waithaka (Gitau, 2010; 2012; Langat, 2012), while others say reverse logistics have negative impact organizational performance, and still limited researchers say there is no tangible relationship between organization performance and reverse supply chain practices (De Giovanni and Vinzi, 2012). Some of the articles that shown positive relationship between reverse supply chain and organizational performance explained the effects of reverse supply chain on organizational performance by directly relating to financial and marketing performance/operational performance of an organization; and others explained in indirect way.

From marketing dimension, Azevedo et al., (2011) explored the positive influence of reverse supply chain practices on organizational performance through enhancement in quality, customer satisfaction and efficiency. Reverse supply chain give chance of feedback for consumers, and information flow from this reverse supply chain enable the firm to satisfy the customers by adjusting the product design or improving the quality of the product based on the real demand of users; and satisfied customers can buy more of the organization's product by being loyal. Therefore, an organization can earn profit in sustainable way from the satisfied and loyal customers. Similarly, reverse logistics enables a firm to offer better customer service by re-capturing value from earlier used, or defective offered products (Tan, Yu, Arun, 2003); Other study done by Ongombe (2012) in the Kenya also indicated the existence of strong relationship between reverse logistics and competitive advantage in water bottling companies.

The economic benefits of reverse supply chain activities on organization performance suggested by numerous benefits. Reverse logistics reduce the amount of inventory to be disposed and this reduces the amount of raw materials to be extracted or to be purchased from suppliers and reduce the amount of energy needed to process. Review of prior research described that practicing reverse supply chain reduce the amount of the end of final products, surplus inventory, or defective products to be disposed as waste. Reverse supply chain can decrease the consumption of raw materials and energy to be used by decreasing amount of waste (Neto et al., 2010; Zhao et al., 2018; Rogers & Tibben-Lembke, 2001); reverse supply chain also increase

profit margin resulting from reduction in production costs (Ongombe, 2012; Eltayeb et al., 2011); recapture value from the scarce resources in cost effective and sustainable way (Melbin, 1995; Eltayeb et al., 2011) and create green supply chains that build positive image that advance the competitive advantage and overall economic performance of a firm (Rao and Holt, 2005); and reduce production costs by using less power, and cheaper raw materials from end of finished products (Laosirihongthong et al., 2013).

Environmental performance of an organization is commitment of an organization to environmental quality just to meet legislation imposed by government or to build positive image by meeting what society expect from the organization on the maintenance of ecological balance (Judge and Douglas, 1998). Successful adoption and implementation of reverse logistics enhance ecological performances which further support achievement of improved organizational performance (Green et al., 2011); promote an image of environmental responsibility that advance organizational sales by fostering good will (Rao and Holt, 2005); save pollution of the environment by decreasing amount of hazardous end of life products to be disposed or proper disposition (Rogers & Tibben-Lembke, 2001); save the environment by reducing raw materials to be extracted, and decreasing emissions of polluted air to the environment (Hervani et al., 2005; Veleva et al., 2007); and save the environment from air and water pollution, from consumption of harmful and toxic materials, and reduce solid waste (Zhu et al., 2008; Maxwell and Van der Vorst, 2003). Generally, environmental performance of an organization from practicing reverse supply chain is seen from the ability of an organization to contribute or to maintain quality environment or restricting activities that pollute the environment.

Generally, setting a well-defined supply chain goal and performance indicators enhance complexity of supply chain performance measurement (Panayides and Lun, 2009). As (Maskell, 1989) indicated whatever the proposed system of measurement, a system needs to follow performance measurement principles that directly related to firm's strategy, using nonfinancial measures, using varying criteria that fit the departments or companies, varying the performance measurement base as situations needs, using simple and easy criteria to overcome complexity, providing fast feedback to timely adjustment or correction if necessary and using performance measurement principle that inspire continuous improvement.

6. Conclusion and Future Research directions

We have no longer isolate and talk about suppliers, producers, distributors and consumers separately as an independent entity because of their interdependence in supply chain partners. Not only this; isolating and dealing with only one side of supply chain practices make supply chain practices incomplete and inefficient. Forward supply chain is all activities that deal with the smooth flow of raw materials, finished products and information within supply chain network starting from suppliers to final consumers, while reverse supply chain is the process of planning, implementing and controlling the efficient and cost-effective flow of raw materials, end of life products, defective products or surplus inventory and feedback information from the point of consumption to the point of origin for the purpose of recapturing or creating value or for right disposal. Therefore, there is a need to focus on closed loop supply chain practices for sustainability of economy and environment. Based on the above literature review the following direction forwarded as future research directions:

More research has been carried out in limited dimension of supply chain management; transportation, inventory, facility location or information sharing alone. However, supply chain performance is a function of combination of different variables. Therefore, it is advisable for researcher to fill this gap by further considering more than one variable to measure the effects of supply chain practices. Similarly, large number of previous research measured only limited dimensions of supply chain performance. Therefore, it is advisable for future researcher to measure supply chain performance from multi dimension, especially in case of reverse supply chain, considering simultaneously economic performance, environmental performance and marketing performance. Finally, almost all previous researcher only focused on forward logistics, even those that focused on reverse supply chain neglected and concentrated only reverse flow, but forward and reverse supply chains are interdependent on one another and dealing only on one sided flow make supply chain inefficient. Therefore, it should be the future research direction to conduct on closed loop supply chain to understand the real performance of supply chain performance.

References

- Aburadi, N. (2016). The Impact of Supply Chains on Productivity and Financial Performance of Power Producers in Australia .
- Akdoğan, M. Ş., & Durak, A. (2016). Logistic and marketing performances of logistics companies : A comparison between Germany and Turkey. *Procedia - Social and Behavioral Sciences*, 235(October), 576–586. <https://doi.org/10.1016/j.sbspro.2016.11.084>
- Alan R., Phil C. & Peter B., (2006). The Handbook of Logistics and Distribution Management 3rd Edition <https://www.amazon.com/Handbook-Logistics-Distribution-Management/dp/0749446692>
- Aziz, R., Hillegersberg, J.V. and Kumar, K. (2010). Inter organizational relationships performance in third party logistics: conceptual framework and case study. In: Pioneering Solutions in Supply Chain Management, A Comprehensive Insight

- into Current Management Approaches, Erich Schmidt Verlag, pp.105-126.
- Bayraktar, E., Gunasekaran, A., Koh, S. C. L., & Tatoglu, E. (2010). An efficiency comparison of supply chain management and information systems practices : a study of Turkish and Bulgarian small- and medium-sized enterprises in food products and beverages, *7543*. <https://doi.org/10.1080/00207540903174957>
- Barbarosoğlu, G., Özdamar, L. and A. Çevik,(2002). An interactive approach for hierarchical analysis of helicopter logistics in disaster relief operations, *European Journal of Operational Research*, 140, 118-133.
- Beamon, B.M. (1998). Supply chain design and analysis: models and methods, *International Journal of Production Economics*, 55, 281-294.
- Beamon, B.M. (1999). Measuring supply chain performance, *International Journal of Operations & Production Management*, 19(3), 275-292.
- Bichou, K., & Gray, R. (2007). A logistics and supply chain management approach to port performance measurement, *8839* <https://doi.org/10.1080/0308883032000174454>
- Biman, B., & Chaki, N. (2012). A Distributed Retail Beer Game for Decision Support System, *65(ICIBSoS)*, 278–284. <https://doi.org/10.1016/j.sbspro.2012.11.123>
- Boonmee, C., Arimura, M., & Asada, T. (2017). International Journal of Disaster Risk Reduction Facility location optimization model for emergency humanitarian logistics. *International Journal of Disaster Risk Reduction*, 24(February), 485–498. <https://doi.org/10.1016/j.ijdr.2017.01.017>
- Busse, C., Schleper, M. C., Niu, M., Wagner, S. M., & Busse, C. (2016). Supplier development for sustainability : contextual barriers in global supply chains. <https://doi.org/10.1108/IJPDLM-12-2015-0300>
- 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. <https://doi.org/10.1080/00207540310001602865>
- Childerhouse, P., Aitken, J., & Towill, D. R. (2002). Analysis and design of focused demand chains, *20*, 675–689.
- Chizzo SA. 1998. Supplychain strategies: solutions for the customer-driven enterprise. Software magazine. Supplychain management directions supplement January4–9, 1998.
- Corswant, Fredrik von, Anna Dubois, and Peter Fredriksson (2004), "Organizing activities in industrial networks: The case of Volvo S80," in 20th annual IMP conference. Copenhagen.
- Council of Supply Chain Management(2005). Supply Chain Operations Reference Model, SCOR version 7.0. Overview, 2005, p. 7.
- Cox, J.F., Blackstone, J.H., Spencer, M.S. (Eds), (1995). APICS Dictionary, American Production and Inventory Control Society, Falls Church, VA.
- Debela, F. M. (2013). Logistics Practices in Ethiopia.
- De Langen, P.W., Nijdam, M. and Van Der Horst, M. (2007). New indicators to measure port performance. *Journal of Maritime Research*,4(1),23-36.
- Disney, S.M., Naim, M.M. & Towill, D.R. (1997) "Dynamic Simulation Modelling for Lean Logistics", *International Journal of Physical Distribution and Logistics Management*, 27(3),174-96.
- Vendor-Managed Inventory and Bullwhip... (PDF Download Available). Available from: https://www.researchgate.net/publication/242344693_Vendor-Managed_Inventory_and_Bullwhip_Reduction_in_a_Two-Level_Supply_Chain [accessed Apr 26 2018].
- Dong, Y., C.R. Carter & M.E. Dresner. "JIT Purchasing and Performance: An Exploratory Analysis of Buyer and Supplier Perspectives," *Journal of Operations Management*, (19:4), July 2001, pp. 471-483.
- Fawcett, S. E., & Magnan, G. M. (2008). Benefits , barriers , and bridges to effective supply chain management, *1*, 35–48. <https://doi.org/10.1108/13598540810850300>
- Feldmann M, Müller S. (2003). An incentive scheme for true information providing in supplychains. *OMEGA* 2003;31(2):63–73.

- Fernie, J., & Mckinnon, A. C. (2011). The grocery supply chain in the UK : improving efficiency in the logistics network The grocery supply chain in the UK : improving efficiency in the logistics network, 3969. <https://doi.org/10.1080/0959396032000051693>
- Ferrell, O. , Rogers, M., Ferrell L., & Sawayda J. (2013.). A Framework for Understanding Ethical Supply Chain Decision Making A Framework for Understanding Ethical Supply Chain Decision Making, (September 2013), 37–41. <https://doi.org/10.1080/1046669X.2013.803428>
- Fisher, M.L., (1997). What is the right supply chain for your product? Harvard Business Review 75 (2), 105}116.
- Georgise, F. B., Thoben, K., & Seifert, M. (2014). Supply Chain Integration in the Manufacturing Firms in Developing Country : An Ethiopian Case Study, 2014.
- Gligor, D. M., Holcomb, M. C., Gligor, D. M., & Holcomb, M. C. (2012). review Understanding the role of logistics capabilities in achieving supply chain agility : a systematic literature review. <https://doi.org/10.1108/13598541211246594>
- Gunasekaran, A., & Kobu, B. (2007). Performance measures and metrics in logistics and supply chain management : a review of recent literature (1995 – 2004) for research and applications, 7543(May). <https://doi.org/10.1080/00207540600806513>
- Gunasekaran, A., Patel, C. and Megaughey, R.E. (2004), “A framework for supply chain performance measurement”, *International Journal of Production Economics*,87(3),333-347.
- Ben-Tal, B., Chung, S. R. Mandala, and T. Yao(2011). Robust optimization for emergency logistics planning: Risk mitigation in humanitarian relief supply chains, Transportation research part B: methodological. 45, 1177-1189.
- Huang, Y., & Hsieh, M. (2015). Exploring the most influenced financial determinants of supply chain management by cross-employing factor analysis approach and fuzzy set qualitative comparative analysis method, 7(51), 1–8. <https://doi.org/10.1177/1687814015620329>
- Investopedia. (2016b). Supply Chain. Retrieved from: <http://www.investopedia.com/terms/s/supplychain.asp>
- Jayaram, J., Droge, C. and Vickery, S.K. (1999), “The impact of human resource management practices on manufacturing performance”, *Journal of Operations Management*,18(1),1-20.
- Kotler, P., & Wong, V. (n.d.). *Principles of Marketing*.
- Krajewski, L. J., 2007. Operations Management. 8th ed. New Jersey: Prentice Hall.
- Krause, D. R., Ellram, L. M., Krause, D. R., & Ellram, L. M. (1997). ; Success factors in supplier development.
- Kuse, H., Endo, A., & Iwao, E. (2010). Logistics facility , road network and district planning : Establishing comprehensive planning for city logistics, 2(3), 6251–6263. <https://doi.org/10.1016/j.sbspro.2010.04.035>
- Kwak, D. (2016). The impact of innovativeness on supply chain performance: is supply chain integration a missing link ? <https://doi.org/10.1108/SCM-02-2014-0058>
- Lee HL, Billington C (1995) The evolution of supply-chain-management models and practice at Hewlett-Packard. *Interfaces* 25(5),42–63
- Lemma, H. R., Singh, R., & Kaur, N. (2015). Determinants of supply chain coordination of milk and dairy industries in Ethiopia : a case of Addis Ababa and its surroundings. *SpringerPlus*. <https://doi.org/10.1186/s40064-015-1287-x>
- Li, S., Ragu-nathan B., Ragu-nathan T. ., & Rao S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance, 34, 107–124. <https://doi.org/10.1016/j.omega.2004.08.002>
- Lieberman, M.B., Helper, S., L. Demeester. 1999. The empirical determinants of inventory levels in high-volume manufacturing. *Production and Operations Management*, 8(1), 44-55.
- Lotfi, Z., Sahran, S., Mukhtar, M., & Zadeh, A. T. (2013). The Relationships between Supply Chain Integration and Product Quality. *Procedia Technology*, 11(Iceei), 471–478. <https://doi.org/10.1016/j.protcy.2013.12.217>
- Lummus, R.; Albert, K.. (1997). Supply chain management: balancing the supply chain with customer demand, Falls Church, VA Apics, 1997.
- Maskell, B. (1989). Performance measurement for world class manufacturing, *Management Accounting*,67(5),32-3. [Google

Scholar] [Infotrieve]

- Mason-Jones, R., & Towill, D. (1997). Information enrichment: designing the supply chain for competitive advantage. *Supply Chain Management*, 1997,2(4),137-48.
- Mason, R., Lalwani, C., Mason, R., & Lalwani, C. (2007). Transport integration tools for supply chain management, 5567.
- Melo, M.T., Nickel, S. and Saldanha-da-Gama, F. (2009), "Facility location and supply chain management – a review", *European Journal of Operational Research*,196,401-12.
- Ministry, F. (2015). FDRE Ministry of Industry Ethiopian Cement Industry Development Strategy.
- Minten, B., Tamru, S., Kuma, T., & Nyarko, Y. (2014). Structure and performance of Ethiopia 's coffee export sector.
- Monczka, R.M., Petersen, K.J., Handfield, R.B. and Ragatz, G.L. (1998). Success factors in strategic supplier alliances: the buying company perspective, *Decision Sciences*, 29(3), 553-78.
- Morgan, N.A., Vorhies, D.W. and Mason, C.H. (2009), Market orientation, marketin capabilities, and firm performance, *Strategic Management Journal*, 30(8),909-920.
- Neeraja, B., Mehta, M., & Arti, P. (2014). Supply Chain and Logistics For The Present Day Business. *Procedia Economics and Finance*, 11(14), 665-675. [https://doi.org/10.1016/S2212-5671\(14\)00232-9](https://doi.org/10.1016/S2212-5671(14)00232-9)
- Oliver, r. k. and Webber d., (1992). Supply chain management: logistics catches up with strategy. In christopher, M. G., (ed) *Logistics, The Strategic Issue* (London: Chapman & Hall).
- Onay, M. and Kara H.S. (2009), Lojistik dış kaynaklama uygulamalarının örgüt performansı üzerine etkileri, *Ege Akademik Bakış*, 9(2),593-622.
- Panayides, P., & Lun, Y. (2009). The impact of trust on innovativeness and supply chain performance. *International Journal of Production Economics*, 122, 35-46.
- Parmar, V., & Shah, H. G. (2016). A literature review on supply chain management barriers in manufacturing organization. *International Journal of Engineering Development and Research*, 4(1), 2321-9939.
- Project, R. (2013). Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes.
- Shen, Z.M. and Qi, L., (2007). Incorporating inventory and routing costs in strategic location models. *European Journal of Operational Research*, 179, 372-389
- Shen, W., Kremer, R., Ulieru, M. and Norrie, D. (2003). A collaborative agent-based infrastructure for internet- enabled collaborative enterprises", *International Journal of Production Research*, Vol. 41 No. 8, pp. 621-1639.
- Sheu J. (2007). An emergency logistics distribution approach for quick response to urgent relief demand in disasters, *Transportation Research Part E: Logistics and Transportation Review*, vol. 43, pp. 687-709, 2007.
- Stajniak M., Hajdul M., Foltynski M., Krupa A., (2008), *Transport i spedycja [Transport and spedition]*, Instytut Logistyki i Magazynowania, Poznań
- Stein, T., & Sweat, J. (1998). Killer supply chains. *Informationweek*, 708(9), 36-46.
- Sukati, I., Bakar, A., Baharun, R., & Yusoff, R. (2012). The Study of Supply Chain Management Strategy and Practices on Supply Chain Performance. *Procedia - Social and Behavioral Sciences*, 40, 225-233. <https://doi.org/10.1016/j.sbspro.2012.03.185>
- Tan, K.C., Kannan, V.J., Hand"eld, R.B., Ghosh, S., (1999). Supply chain management: an empirical study of its impact on "rm performance. *International Journal of Operations and Production Management*, 19(10), 1034}1052.
- Tan, K. C. (2001). A framework of supply chain management literature. *European Journal of Purchasing and Supply Management*, 7(1), 39-48. [https://doi.org/10.1016/S0969-7012\(00\)00020-4](https://doi.org/10.1016/S0969-7012(00)00020-4)
- Tetik, S. (2003). İşletme performansını belirlemede veri zarflama analizi, *Celal Bayar Üniversitesi Yönetim ve Ekonomi Dergisi*, 10(2),221-229.
- Thanh, P., Bostel, and Péton, (2008). A dynamic model for facility location in the design of complex supply chains. *International Journal of Production Economics*, 113(2),678-693.

Transportation Research Board, Washington, DC. [http://onlinepubs.trb.org/ Onlinepubs/nchrp/nchrp_rpt_463-a.pdf](http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_463-a.pdf)

Wilson, R. (2004). 15th Annual State of Logistics Report. Council of Supply Chain Management Professionals. Available online: <http://www.cscmp.org/>. Frank

Zeki, S., & Keskin, H. (2011). The effect of supply chain integration on information sharing: Enhancing the supply chain performance, *24*, 1630–1649. <https://doi.org/10.1016/j.sbspro.2011.09.016>

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