A Study on Transport Cost Optimization in Retail Distribution

Shilpa Parkhi*, Jagadeesh D, R. Arun Kumar****

**Associate Professor, Symbiosis Institute of Operations Management, Nashik, Maharashtra, India.*
E-mail: shilpa.parkhi@siom.in

***Scholars, Symbiosis Institute of Operations Management, Nashik, Maharashtra, India.*
E-mail: reachmejash@gmail.com,arunrk89@gmail.com

Abstract

The aim of the paper is to optimize the logistics cost at the secondary distribution network of the retail supply chain. Transportation takes a crucial part in the manipulation of logistic. The operation of transportation determines the efficiency of moving products. This paper discusses the importance of transportation in retail logistics and various cost involved in it. Distribution network is optimized by load planning optimization and network optimization. This paper analyses various factors and provides solution to reduce the transportation costs so that contribution margin can be increased. This study is limited to retail distribution network in business to customer (B2C) channel. On completion of thorough literature review the paper identifies the research gaps in the area and ends with a conclusion and future scope of work.

Keywords: Logistics Cost, Network Optimization, Capital Expenditure, Logistics Oriented Costing

Introduction

Transportation refers to the movement of item for consumption from one locality to another to make the product obtainable to the customer. There are five basic modes of transportation: Rail, Road, Air, Water and Pipeline. Each transportation mode has different cost and service characteristics. Transportation plays a significant role and has impact on overall impact on performance efficiency and effectiveness of reverse logistics (Shaik and Kader, 2013). As transportation is the major cost component of logistics, reduction in costs will have great impact of overall logistics cost. This paper explains what are the components of cost involved in retail transportation both fixed and variable cost. It deals with how to reduce logistics cost by building efficient transportation network, improving truck utilization, improving fleet utilization, analyzing the load flow to stores and leveraging information technology.

Research Questions

RQ1: To understand importance of Transportation in Retail Logistics.

RQ2: To analyze the various cost components involved in Retail Transportation; both fixed costs and variable costs.

RQ3: To identify various factorsthat reduces costs and increases the contribution margin.

Over the decade logistics has become a key strategic function for the retailers (Bourlakis and Bourlakis, 2001). Because of the retail revolution logistics becomes retailer driven. Co-ordination between warehouse and transport activities is very important. Re-engineering the entire supply chain plays a major role in logistics performance. In this way, logistics becomes increasingly important in large retailers value chain (Norek, 1997). According to Parkan and Dubey (2009), significant modernization of logistics is required in Indian manufacturing and services industry. The paper also argues that with increased FDI in agricultural and retail sectors will drive the growth of Indian logistics sector. Organized retail in India has achieved rapid growth at a significant cost. According to Dröge et al (1991), logistics is becoming an increasingly important part of overall retail strategy because it provides opportunities for enhanced profit, market growth and sustainable competitive advantage. The factors which have impact on retail logistics are warehousing/ transportation, supplier performance/communication,

internal information systems, activity leveling and inventory/cost reduction.

Consumerism is witnessing an unprecedented growth in India which is driven by increase in the level of disposable income, urbanization and brand orientation. Also young population makes India a highly potential retail market. India has evolved to support the unique needs of our country, given its size and complexity since independence. India with its vast expanse and young population emerges as highly potential retail market. Retail is the final stage of any economic activity. By virtue of this fact Retail occupies an important place in the world economy. The Indian retail industry has experienced tremendous growth over the last decade with a significant shift towards organized retailing format and development taking place not just in major cities and metros, but also in Tier II and Tier III cities. According to Retailers Association of India (RAI) currently India's retail market was estimated at US$520 billion and is expected to grow at a CAGR of 13% to reach around US$950 billion by 2018. Organized retail penetration will reach 10% by 2018 which is currently estimated at 7.5%.

Literature Review

To understand and asses the current status of transportation in retail logistics and its cost factors, the literature review was carried out. The scope of transportation in retail logistics is of growing importance as the profit margins are becoming thin. Several literatures have been reviewed to understand the importance of transportation costs and ways to reduce it to increase the contribution margin.

Research Methodology

The objective of the paper is to identify the factors which widen the contribution margin in retail transportation. Generally the cost of transportation incurred should be less than 2% of cost of goods transferred from distribution centre to retail store. Transportation cost constitutes two components, fixed costs and variable costs. Contribution margin of the scheduled delivery is usually calculated for every month/annually.

References	Major Findings
Hua et al (2014)	Logistics distribution involves preparing goods in the distribution centre or logistics node for most reasonable delivery according to the requirements of customers. Genetic algorithm is a random global search algorithm based on the principle of natural evolution. It can be a good solution to optimize the distribution routes. The experimental results show that it can solve the logistics distribution routing problem. Also it can not only get a higher qualified solution, but can also significantly reduce the evolutionary generation that algorithm requires, and obtain solution to the problem in less time.
Dubey et al (2014)	The paper offers a model for sustainable supply chain network where it describes about maximizing the supply chain surplus (economic) and minimizing the carbon emission (environmental). The paper finds that the environmental dimensions were ignored in comparison to the economic criteria in a study conducted in one of the Indian company.
Corominas (2013)	This paper deals with concept of supply chain and how the term evolved by analyzing the material and theoretical roots. Describes the content, implication and whether the concept is really useful in the current scenario. It presents the situation of inadequacy where the concept of supply chain fails to reflect on the current reality. Also analyses the recent activities in the field, challenges faced, the switch points and further scope to work on it.
Dubey et al (2013)	Supply Chain Management may be defined as the management of upstream and downstream associations with vendors and customers to provide better customer value at least cost to the supply chain.
Bouzekri et al (2013)	Transportation is an irreplaceable part of the supply chain through which economic and social development is possible. But at the same time it is the largest contributor of the carbon dioxide and green house gas emissions. The paper presents a methodology of ant colonization system through which the calculation of the emission is possible and also able to identify cleaner routes for transportation.
Melnyk et al (2013)	In today's world the concept of supply chain is gaining lot of importance which is very essential but is very poorly understood. The paper presents with a three tier framework (influencers, design decisions and building blocks) to understand the concept and presents with lot of opportunities to explore further.

Olavson et al (2010)	In today's volatile economy, one supply chain design is probably not enough. What's really needed is a portfolio of supply chains that at once enables you to be cost effective and yet agile and highly responsive in situations where those competencies are called for.
Dubey (2010)	This paper provides an in depth review on evolution of vehicle routing problems from savings matrix to time dependent vehicle routing problems. It is suggested that as how VRPBH framework of Goetschalckx and Jacobs-Blecha has offered better solution to routing problems than Clarke-Wright Savings matrix. And with the introduction of time – window concept the result of heuristic has improved drastically. This is further extended by latest work on time dependent variable vehicle routing algorithm.
Johnson et al (2010)	Warehouses are a substantial component of logistic operations and an important contributor to speed and cost in supply chains. Apart from benchmarks for individual warehouse functions such as order picking, little is known about the overall technical efficiency of warehouses. This article addresses this gap by describing both a new methodology for assessing warehouse technical efficiency based on empirical data integrating several statistical approaches and the new results derived from applying the method to a large sample.
Parkan et al (2009)	In India supply chain cost can be divided in two main categories. a) Distribution costs: which is generally logistics cost. b) Inventory value and inventory holding costs: which mainly consist of cost of inventory and cost of keeping inventory in storage location
Baseer et al (2007)	The Indian retail industry has come forth as one of the most dynamic and fast paced industries with several players entering the market. Today, due to Indian retail reforms the total concept and idea of shopping has undergone an attention drawing change in terms of format and consumer buying behavior, ushering in a revolution in shopping in the country.
Sachan et al (2005)	SCM should not be studied alone and its interest should not be only industrial development. Concepts such as market orientation, relationship marketing. Should be studied with SCM. There is need of new boundaries of SCM which can incorporate all this concepts in to SCM.
Steg et al (2005)	The society prefers for short-term gains at the cost of long-term losses to society. Sustainable transport implies balancing current and future economic and environmental qualities. This may conflict with individuals short-term interests. Measuring quality of life, their relations to sustainable transport alternatives, and the potential implications for informing policy, are considered. There is always a tradeoff between sustainability of transport and the quality of life.
Chen, et al (2004)	Supply chain management is not only limited to Logistics activities and planning and control of materials and information flow internally within the company or externally between companies. It also deals with the strategic decisions such as inter organizational issues, alternative organizational form to vertical integration. It is also the management of relationship between suppliers and customers.
Chopra (2003)	Describes framework for designing the distribution network in a supply chain and various factors influencing the choice of distribution network are described. Relative strengths and weaknesses of the different choices of distribution networks are also analyzed. It identifies distribution networks that are best suited for a variety of customer and product characteristics.
Skojett-Larsen (1999)	SCM can be seen from many perspectives such as system engineering, economics, sociology and management.
Fuller et al (1993)	Logistics should be tailored correctly to fit the needs of the company and its customers. If done then it could become the next governing element of strategy as an inventive way of creating value for customers. An immediate source of savings, an important discipline on marketing, and a critical extension of production flexibility.
Shapiro (1984)	Consolidation of distribution centers should be done. A reduction of investment in finished goods inventory, a centralization of the purchasing and materials management functions, a switch to intermodal truck and rail transport combinations should be incorporated. For full truckload shipments a change in pricing policy should be there to encourage customers.
G. Lilen et al (1976)	Current research in retail outlet management suggests that managers should focus their attention on a few key concepts when deciding strategic and tactical issues. Empirical studies show that in a variety of product areas, particularly in convenience goods, the share of retail outlets held by a company is related to that company's market share.

Contribution Margin = Total Revenue – Variable cost

Following research methodology is adopted in this paper

Step 1 – Study of retail distribution network and the various costs involved

Step 2 – Defining the contribution margin

Step 3 – Ways to increase the transportation performance

Step 4 – Achieving a wider contribution margin

Retail Distribution Network

According to Hua et al. (2014) logistics distribution involves preparing goods in the distribution center for most reasonable delivery according to the requirements of

stores. Distribution network in retail perspective includes the transportation from distribution center with a multi-vehicle distribution vehicle delivery to multiple stores. It should satisfy the following conditions:

(1) Each delivery path of each store demand and delivery of the vehicle does not exceed the carrying capacity; (2) The length of each distribution route delivery vehicles does not exceed the maximum travel distance delivery time; (3) Each delivery of goods cannot exceed the time required. A network design is considered as appropriate if it performs well with respect to revenue, costs and delays (i.e. delivery time).

Transportation

Tracey (2004) stated that transportation is often ignored as a source of competitive advantage. The work stated that transportation performance depends upon the terms like delivery schedules, product quality, satisfactory delivery service and acceptable overall performance. Luo (2007) provided the insight that the delays in transporting, sorting, grading and disposition only serve to reduce the value remaining in the product.

Efficient transport services with less environmental impact are increasingly important in the retail sector. An average of fifty percent of total logistics cost is due to transportation. Efficient transportation system will provide a competitive edge to the retailer. Retailers have increased control over their distribution network i.e., distribution centre to retail stores. Road mode of transportation is used in distribution of retail supply chain. Distribution centre and transportation network are remarkably expensive if not controlled effectively. This paper deals with reduction in transportation costs of the distribution network in the retail supply chain. Vehicles to transport goods between warehouses and retail stores are not cheap, both in terms of capital and running costs. India spends 15 to 20% of its GDP on transport and logistics compared to an average 8 to 10% in other developing countries.

Costs Involved in Transportation

Zeng and Rossetti (2003) classified the key logistics cost elements into six categories, namely transportation, inventory holding, administration, customs charges, risk and handling and packaging costs. Transportation cost has been a very common topic of research. Examples of these include the routing of transportation (Eilon et al., 1971), minimization of transportation cost (Bodin et al., 1983), etc. believed that the transportation cost should relate to the travel distance between the warehouse and destination, and such cost should include the driver's wages, equipment cost and in-transit inventory cost.

According to Wu (2014), of all the costs in the transportation, distribution costs accounted for a very high proportion. Path planning problem is the core issue of the distribution system, and the research focus too. Reasonable path arrangement can effectively improve transport efficiency and reduce service costs. Yang et al. (2014) stated that a good routing for logistic distribution can cut down transport cost and improve efficiency. The efficiency of it has great influence on improving whole efficiency of logistics system and reducing transport cost. Karabuk (2007) developed integer-programming models and a computerized decision-support system to address the problem of scheduling the delivery of daily inventory movement.

Sahin et al. (2009) stated that one of the important parameters in the determination of optimal transportation costs is the state of the economy. The authors further stated that realistic technical, economical, and operational parameters are needed for determining transportation costs. Sahyouni et al. (2007) developed three generic facility location models for the integrated distribution and collection of products. The models quantified the value of integrated decision making in the design of logistics networks by focusing on facility and transportation costs throughout different stages of a product's life cycle.

The trucks used in distribution network can either be owned by retailer or can be rented from 3rd Party Logistics provider. The fixed costs involved in transportation are time related cost. Capital costs (vehicle cost), vehicle taxation, vehicle insurance, driver salary and overhead cost fall under fixed costs.

The variable costs involved in transportation are running costs. Fuel cost, oil & lubricants cost, vehicle repair and maintenance, tires & tubes cost, trip allowance to crew, loading and unloading personnel cost, other operating cost

If the truck is owned by the retailer, retailer has to bear all the risks of breakdown, fitness certificate, accidents etc. As 3rd Party Logistics provider will be having large scale of operation, these risks can be avoided based on the credibility of the logistics provider. Depreciation of capital cost should be taken into account if the truck is owned by the retailer.

Contribution Margin

Contribution margin provides contribution for meeting fixed costs and generating incomes for firms. This concept is a notion which is frequently applied by firm for making their strategic decisions. Operating costs are thus defined as the sum of total fixed and total variable costs. The contribution margin may be defined as the difference between Total Revenue (TR) and Total Variable Costs (TVC) (Broyles et al., 2003).

In retail format it is difficult to achieve breakeven. In current scenario, Indian economy is slowly getting exposed to foreign players. This makes the situation even worse for Indian retailers. Hence they should reduce overall cost to be competitive enough to sustain in the market. The transportation cost is usually taken as the % of cost of goods sold.

Contribution margin = % of Cost of Goods Sold – Variable costs

In the case of retail operations, logistics is not directly creating any revenue. Total revenue is considered to be the permissible cost to be incurred for transportation of goods as per industry benchmark. If the actual cost incurred is less than permissible cost then it is profit and if it is vice versa then it is loss. Total revenue is considered to be the industry benchmark cost i.e., ratio of the transport cost incurred to the amount of goods transferred.

Transport Planning in Retail Distribution Centre

Batch plan contains the details of sequence of store delivery and total number of crates in the respective truck. Batch plan for distribution centre is studied and route optimization is validated. This involves all the process in delivering the goods to the store from the DC. While dispatching the goods, three things are taken into consideration; they are Vehicle Plan, Route Plan and Loading Plan.

Vehicle planning in retail is defined as the allocation of the available vehicle in the fleet to the stores so that truck utilization is optimum and cost incurred is low. The dispatcher must be careful to consider vehicle equipment and conditions, integrate special transport, plan maintenance actions, relay and assign open parking spaces and take into account personnel allocations. Therefore, dispatch systems should give an overview of which vehicle is currently deployed and with which crew. Transport manager looks after vehicle planning. Truck has to be deployed based on the tonnage or cubic utilization. Based on the load of stores, number of stores in a trip and also the compatibility of vehicle to the store, the vehicle to be allotted are decided. Compatibility of vehicle to the store means the road conditions, traffic conditions and parking space required for the vehicle.

Route plan is made to obtain optimum turnaround distance and time. Based on the distance between stores, load of each store and truck capacity a route plan is made. Route plan is made to comply with the city entry restrictions and on-time delivery to stores. Delivery sequence is formulated in route plan. Backhauling is done to collect empty crates from the stores.

Load plan is the process of obtaining optimum truck utilization by clustering of stores based on the store load. It is done based on route plan. It also gives us the order in which vehicle has to be loaded so that first stores stock be at the entrance of the container. Last In First Out (LIFO) technique is used to improve productivity. Load plan is done after vehicle plan and route plan is done.

Cost Factors

Truck Volume Utilization: Truck utilization is defined as the percentage of truck capacity that is filled with goods. The number of HUs of particular dimension or weight that a particular truck can carry should be determined. Capacity of the truck can be considered based on the volume or tonnage depending on the type of goods handled. Based on the store load, batch plan is made. It comprises of vehicle plan, route plan and load plan is as explained in previous sections. Batch plan contains the details of sequence of store delivery and total number of crates in the respective truck. A truck will carry the load to single store or multiple store depending on the load of the stores. The main objective of the transport planner is to fully utilize the truck capacity.

Fleet utilization: Fleet utilization is the number of vehicles in service from the total given number of vehicles. Vehicle can be utilized if it is available for service. In usual cases an average of around 30% of the total vehicles will be off road due to breakdown, accidents and renewal of Fitness Certificate (FC). This is due to poor road conditions in India, lack of training and proper Maintenance of vehicles. Transport Planner in DC will have a track of all the vehicles current status. If the available vehicle is not enough to meet the demand of the customer i.e., stores, alternate plan should be made. Market vehicle should be

obtained to meet the demand. On Time Delivery (OTD) and Customer Satisfaction should be the primary goal of the Transport Planner.

Route Optimization: The basis for route optimization is the use of models to describe the transport network that needs to be planned. When building a model, the scope of the overall network needs to be defined, ensuring that all the data is included. The model has a number of components such as products, vehicles, personnel etc. The product will be defined by its weight and its volume, which are important factors. The product moves from one geographic location to another, i.e. origin and the destination. A transportation network within the model can be divided into a number of sectors which is represented by a vehicle, which moves between an origin and a destination location. Each vehicle may have different attributes such as volume or weight capacity, loading times, cost per mile, and vehicle limitations, i.e. speed of the vehicle. The personnel assigned to the model have characteristics that are governed by the type of work they perform. In retail distribution the Vehicle Routing Problem with LIFO principle is followed which is very similar to Vehicle Routing Problem with Pickup and Deliveryexcept an additional restriction i.e. the item being delivered must be the item most recently picked up.

Transport cost depends on the distance covered by the truck which carries the goods. Transportation models play an important role in reducing cost and improving service. Therefore, the goal is to find the most cost effective way to transport the goods. Considering'm' warehouses which supplies goods to 'n' geographically dispersed retail centers, each with a given demand. The objective is to determine the minimum possible transportation costs. Considering C_{ij}as the unit cost of transportation between the i^{th} warehouse and the j^{th} retail center then the objective function becomes:

$$Min \sum C_{ij}X_{ij}$$

While targeting the above objective function, the challenge is also to satisfy various operational and logicalconstraints. Constraints such as supply at warehouse, demand at retail center, availability of trucks, availability of manpower, full truck load, road conditions, traffic conditions, green transportation etc have to be taken in to consideration.

Turnaround Time (TAT): It is the total time taken by the truck from loading the truck in the distribution centre, delivering it to retail stores and returning back to the distribution centre for reloading. TAT includes loading time, document verification time, travelling time, idle time and retention time in stores. Retention time in stores can be further detailed as waiting time, document verification time, inspection time and unloading time. By reducing turnaround time, the truck can be utilized more i.e., more delivery schedule. Also resource will be readily available to planning department for next schedule.

Backhauling: On each route, after all deliveries are made, returnable items are picked up and brought back to the depot. Shear (1997) stated that combining 'pallet rate' pricing from carriers and pallet tracking from store to-vendors allows for the most cost efficient hauling of returned items.For the re-use purposes,crates and empty cartons are hauled back to DC from stores. The crates used are foldable in nature. The foldable structure provides more space utilization and helps in backhauling purposes.Long-lasting crates replace traditional packing, provides great cost savings over disposable material. Robust construction ensures products are well protected. Extra lightweight crates are used for handling ease.

Information Technology: Information technology plays a major role in today's world as it brings the communication faster by reduction of significant amount of costs.

1) Enterprise Resource Planning: ERP software provides a platform for order generation, receiving, processing and delivery of order. In retail, Stores can generate the order/indent required in ERP so that DC will have increased planning horizon. Once DC acknowledges the order store will be notified that the order is getting processed. It will also give the date and time of delivery to the stores. In turn stores will generate Goods Receipt (GR) in ERP if accepted or Goods Return to DC (GRDC) if rejected. Thus ERP increases the coordination between DC and stores, also facilitates the communication in easier way. Distribution Order (DO) code is generated by the ERP software and based on DO code, DO label containing the barcode is generated. Label will be scanned and products in the HU will be stored in it. Distribution order label along with product details should contain the DO number and destination stores will be pasted on the HU. This avoid wrong delivery to stores because if DO is scanned in stores it will not accept the entry. This avoids inspection time and also excess cost due to wrong delivery which in turn reduces the unloading time.

2) Building Transportation Network Model: The most common application of IT in Transportation is to determine transportation routes. The software should operate based on the following inputs: location of the customers (stores), desired delivery times, distance between stores, vehicle capacity, truck volume utilization, less turnaround time. Network model should also consider external factors such as traffic conditions, road conditions, government regulations and parking space available in store. Certain store road traffic conditions are difficult at specific times; hence the stores should be classified based on schedules such as wave 1, wave 2 and wave 3. Each wave has a set of stores to be delivered in specific time window.

Conclusion

The reduction in cost of transportation in retail distribution is of prime importance because of the very less margin. This paper discussed various cost factors of transportation in detail and importance of each factor is detailed. Concentrating on these factors the transportation cost can be reduced. The overview of retail and logistics sector is discussed. The effort towards reduction in transportation cost is the main research area in the retail sector for the last few decades. Hence to understand and asses the current status of these areas, the literature review was carried out. The costs that are not value adding has been identified and several solution for reducing each cost component is elaborated in the paper. The paper presents solution to increase the contribution margin thereby reducing the variable cost involved in transportation by implementing the factors mentioned above.

Further Research Directions

Implementation of these recommendations needs to be studied in detail. This paper focuses on reduction in variable costs involved in transportation thereby increasing the contribution margin. Fixed cost component in transportation is not discussed here. A very basic transportation model is discussed which can be further enhanced to include additional constraints and to accommodate some exceptional user requirements. The paper is talking about retail transportation and hence it cannot be applied to other sectors.

References

Baseer, A., & Prabha, G. L. (2007). Prospects and problems of Indian retailing. *Indian Journal of Marketing*, 37(10).

Bourlakis, C., & Bourlakis, M. (2005). Information technology safeguards, logistics asset specificity and fourth-party logistics network creation in the food retail chain. *Journal of Business & Industrial Marketing*, 20(2), 88-98.

Bouzekri, A., Messaoud, E., & Alaoui, A. (2013). A hybrid ant colony system for green capacitated vehicle routing problem in sustainable Transport. *Journal of Theoretical and Applied Information Technology*, 54(2).

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.

Chopra, S. (2003). Designing the distribution network in a supply chain. *Transportation Research Part E: Logistics and Transportation Review*, 39(2), 123-140.

Corominas, A. (2013). Supply chains: what they are and the new problems they raise. *International Journal of Production Research*, doi/10.1080/00207543.2013.852700.

Daugherty, P. J. (2011). Review of logistics and supply chain relationship literature and suggested research agenda. *International Journal of Physical Distribution & Logistics Management*, 41(1), 16-31.

Dröge, C., Germain, R., & Stock, J. R. (1991). Dimensions underlying retail logistics and their relationship to supplier evaluation criteria. *International Journal of Logistics Management, The*, 2(1), 19-25.

Dubey, R., & Gunasekaran, A. (2014). Sustainable supply chain network design: a case of Indian company. *International Journal of Logistics: Research and Applications*. doi:10.1080/13675567.2014.992305.

Dubey, R. (2010). A review on the evolution of vehicle routing problems. *The SAMRIDDHI-A Journal of Physical Sciences, Engineering and Technology (S-JPSET)*, 1(2).

Dubey, R., & Samar Ali, S. (2013). An exploratory study on logistics competency and firm performance. *International Journal of Logistics Systems and Management*, *14*(2), 179-199.

Eilon, S., Watson-Gandy, C. D. T., & Christofides, N. Distribution management: mathematical modelling and practical analysis. 1971. *Griffin, London*.

Froyland, G., Maher, S. J., & Wu, C. L. (2013). The recoverable robust tail assignment problem. *Transportation Science*, 48(3), 351-372.

Fuller, J. B., O'Conor, J., & Rawlinson, R. (1993). Tailored logistics: The next advantage. *Harvard Business Review*, 71(3), 87-98.

Lilen, G., & Rao, A. Emerging approaches to retail management. *Sloan Management Review,* 20(52).

Hua, Z. C., Xin, H., & Wei, Z. (2014). Logistics distribution routing optimization algorithm. *Applied Mechanics and Materials*, 513, 1740-1743.

Jayaraman, V., & Luo, Y. (2007). Creating competitive advantages through new value creation: a reverse logistics perspective. *The Academy of Management Perspectives*, 21(2), 56-73.

Johnson, A., & McGinnis, L. (2010). Performance measurement in the warehousing industry. *IIE Transactions*, 43(3), 220-230.

Karabuk, S. (2007). Modeling and optimizing transportation decisions in a manufacturing supply chain. *Transportation Research Part E: Logistics and Transportation Review*, 43(4), 321-337.

Melnyk, S., Narasimhan, A. R., & DeCampos, H. A. (2013). Supply Chain Design: Issues, Challenges, Frameworks and Solutions. *International Journal of Production Research*. doi:10.1080/00207543.2013.787175.

Norek, C. D. (1997). Mass merchant discounters: drivers of logistics change. *Journal of Business Logistics*, 18, 1-18.

Olavson, T., Lee, H., & DeNyse, G. (2010). A portfolio approach to supply chain design. *Supply Chain Management Review*, 14(4).

Parkan, C., & Dubey, R. (2009). Recent developments in the practice of supply chain management and logistics In India. *Portuguese Journal of Management Studies*, 14(1), 71-88.

Raff, S. (1983). Routing and scheduling of vehicles and crews: The state of the art. *Computers & Operations Research*, 10(2), 63-211.

Sachan, A., & Datta, S. (2005). Review of supply chain management and logistics research. *International Journal of Physical Distribution & Logistics Management*, 35(9), 664-705.

Sahyouni, K., Savaskan, R. C., & Daskin, M. S. (2007). A facility location model for bidirectional flows. *Transportation Science*, 41(4), 484-499.

Shaik, M. N., & Abdul-Kader, W. (2013). Transportation in reverse logistics enterprise: A comprehensive performance measurement methodology. *Production Planning & Control*, 24(6), 495-510.

Shapiro, R. D. (1984). Get leverage from logistics. *Harvard Business Review*, 62(3), 119-126.

Skjoett-Larsen, T. (1999). Supply chain management: a new challenge for researchers and managers in logistics. *International Journal of Logistics Management,* 10(2), 41-54.

Steg, L., & Gifford, R. (2005). Sustainable transportation and quality of life. *Journal of Transport Geography,* 13 (2005) 59-69.

Tracey, M. (2004). Transportation effectiveness and manufacturing firm performance. *International Journal of Logistics Management.* 15(2), 31-50.

Zeng, A. Z., & Rossetti, C. (2003).Developing a framework for evaluating the logistics costs in global sourcing processes: An implementation and insights. *International Journal of Physical Distribution & Logistics Management*, 33(9), 785-803.

Zhao, M., Dröge, C., & Stank, T. P. (2001). The effects of logistics capabilities on firm performance: customer-focused versus information-focused capabilities. *Journal of Business Logistics*, 22(2), 91-107.