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**Research Article**

# Acceptability of Reverse Supply Chain by Manufacturers' of Hosiery Products, Tamil Nadu (India) -an Empirical Study'

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**Abstract:** The concept of sustainability is an important concept in an organization and has permeated to increasing number of managerial decisions. Reverse supply chain helps the organization to achieve this sustainability by been more efficient and effective which they achieve minimizing on their cost. The study observes the status of reverse supply of hosiery products industry in the state of Tamil Nadu, India. The study focuses on the current status of the reverse supply chain and what is the acceptance level of reverse supply chain in the industry. The study was carried out in the state of Tamil Nadu, India. It is an exploratory study with a sample size of 125 from different tiers of cities. The study confirms that all the manufacturers of hosiery products in the state are engaged in reverse supply and are willing to offer replacement guarantee to the dealers and customers. Refurbished products are offer to the retailers/customers at a discounted rate. The limitation of the study is that it is limited to a few locations and with one product; hence generalization is very narrowed down.

**Keywords:** Return management, reverse logistics, supply chain management

## INTRODUCTION

Strategic importance of supply chain has been heightened in this globalized business world as it gives the organization sustainability. A supply chain is a network of facilities built up for procurement of raw materials, conversation of these raw materials into finished goods and distribution of these goods to the final customers. Many companies have a divide between procurement and supply chain operations. These divides robs the organization of its vital efficiencies. Recognizing these gap companies have started to work hard to close it and now these companies sees a sizeable benefits with an integrated and streamlined supply processes. Companies earlier had spent its vital resources in fine tuning forward supply chain. It became more important for the companies to concentrate and optimize their backward chain as the business environment became more competitive. Reverse supply chain became strategically important for the organization as they started facing challenges in disposals of the returns. The forward supply chains which the companies had were not designed to handle the intricacies of reverse supply chains.

Reverse supply chain includes activities like refurbishing, remanufacturing or recycling the products that are returned due to damages, end of life products or because of excess inventory, etc., (Anindya, 2003). Reverse supply logistics was once considered as a trivial part of supply chain and has evolved as an integral part which is either managed internally or outsourced to a professional company. Driving forces for the reverse supply chain is the business economics i.e., direct cost and indirect competition, legal and environmental regulation and social responsibility. Every returned product represents a failed encounter with the customer leading to dissatisfaction. Effective return management helps in enhancing and providing an additional means of improving financial performance and it also helps in establishing a stronger customer relationship with important customers of the company. It is vital for a company to understand the total impact of return products-both financially as well as impact on customer-relationship. Financially carrying cost and inventory storage cost i.e., warehouse space cost had to be incurred by the company. Companies that had effectively handled returned products can actually improve on customer's loyalty to their firms.

## LITERATURE REVIEW

Reverse supply has gained acceptance as competitive necessity. Reverse supply chain has been defined as "the process of planning, implementing and controlling efficient and cost effective flow of raw materials, work-in-process inventory, finished goods and related information from consumption point to point of origin for recapturing value or proper disposal (Anindya, 2003) (Fig. 1).

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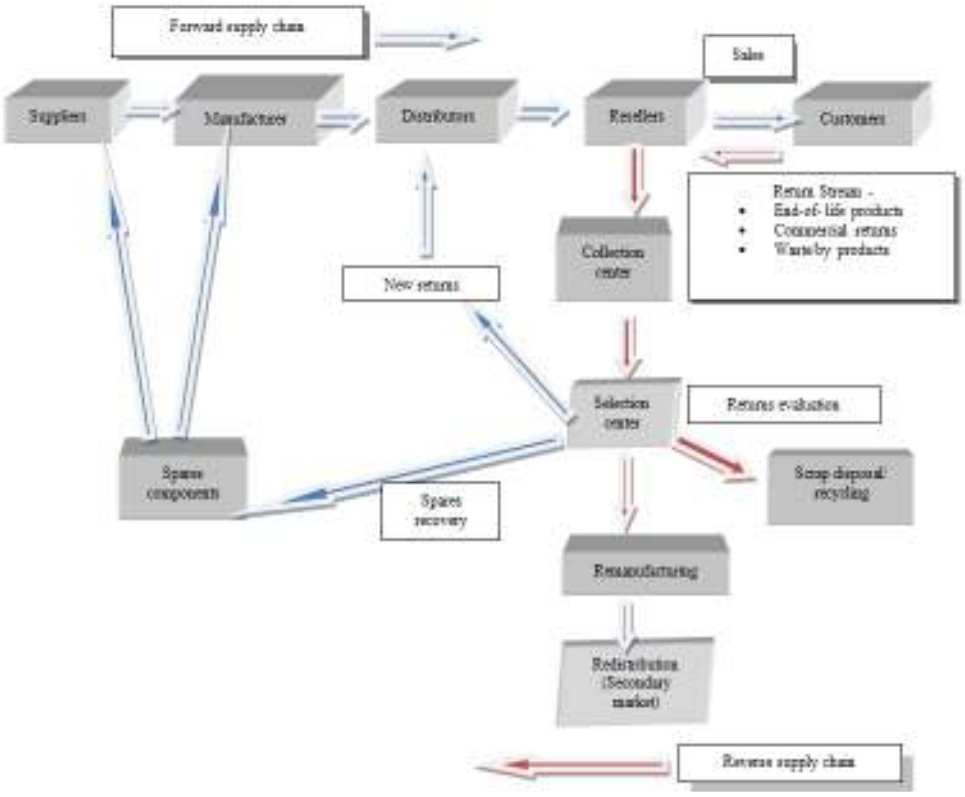


Fig. 1: Supply chain cycle-forward and reverse chain

The reverse supply chain process emerges from return stream of end-of-life products, commercial returns or waste/by products from customers or resellers to a collection center, from where products are send to selection center. At this center the products selection process happens where unused new products are returned back to the distributors in the main stream. An end-of-life product are refurbished/remanufactured and send to distributors to redistribute to secondary market or spares recovery is done which send to suppliers. The rest of the products which cannot be reused are disposed of as scrap (Harrison and Van Hoek, 2008; Kumar and Putman, 2008).

Manufacturers are seeing continuous flow of return products, which is becoming a matter of concern. Reverse supply chain was once viewed as nuisance, is being redesigned to minimize costs. Significant monetary gains have been achieved by companies by redesigning the reverse supply chain (Blackburn *et al*., 2004).

Reverse chain is a process of recovering and processing products which are damaged or redistributing unsold reusable products. A new system which integrates the operational processes and management of the organizational resources is done using an integrated information system. 'Push-pull' approach was proposed to manage the return of the products i.e., supply. Aim was to have a better control of the cost and profits re-injected by the reintroduction of products in to the market. Integration of reverse logistics in the regular supply chain helps the company to become more efficient and effective in managing their entire supply network (Marc *et al*., 2005).

Reverse logistics framework deals with four fundamental characteristics-Why? What? How? Who?

- Why things are returned-driving forces behind reverse logistics? Driving forces behind reverse logistics are economics, legislation and corporate citizenship
- Why sender returns-reasons for reverse logistics? The reasons for reverse logistics are because either the product does not function properly or their functions are not needed anymore. Returns can be manufacturing returns, distribution returns or customer returns
- What is returned? Products characteristics-composition, deterioration, use-pattern
- How reverse logistics process works? In practice reverse logistics works by re-processing to recover
- Who are the actors in reverse supply chain? Forward supply chain actors are supplier, manufacturer, wholesaler and retailers; specialized reverse chain players are jobbers, recycle specialist; and opportunistic player are charity organization (Fleischmann *et al*., 1997; Thierry *et al*., 1995; De Brito and Dekker, 2003)

Reverse supply chain activities can be classified into 3 categories:

- Product returns and management of their disposal
- Refurbishing and remanufacturing the returned products
- Management and sales of the returned products (Nandan and Arnab, 2011)

Reverse logistics operations require to be maintained by an integrated supply chain activity which is multi-faceted. There are three dimensions of management for managing reverse logistics. They are operational performance, organizational integration and management reporting and control:

- Operational performance covering the management of processes such as customer returns, repairs and the final disposal of the goods.
- Organizational integration of the management of reverse retail logistics with other activities such as sales forecasting, returns policies and return avoidance techniques.
- Management reporting and control which includes full cost reporting and performance measurement (Michael *et al*., 2011).

Managing the reverse logistics requires an integrated framework which will help in estimating returns of products from selected categories. The framework should decide on how the products needs to be disposed off, location and capacity and flow of returned products in a given time frame under different constraints like customer related, operational or strategic (Samir and Rajiv, 2006). The Product Residual Value (PVR) is related directly to the recovery process. PVR is low if recovery option is second class i.e., recycling and energy recovery is done; but the PVR will be high if recovery option is of first class i.e., reconditioning and remarketing is done (Chiara, 2011).

Reverse logistics decision is an important decision for a company. The decision regarding reverse logistics whether the company should carry it out themselves or outsource has become a major issue. Marco *et al*. (2007) stated that there are sufficient cost and return parameters that guarantee existence of optimal threshold for outsourcing decision. Large numbers of companies are increasingly giving their logistics to third party logistics service companies. The relationship with this 3PL companies are long term in nature and the service providers continue to deliver value to their clients. The possibility of adopting Radio Frequency Identification (RFID) technology by manufacturer will pose significant challenges to their 3PL providers in coming years (Lieb and Bentz, 2004).

Consumer pressures or environmental laws and regulations are forcing companies to seriously initiate reverse supply chain option (Blumberg, 2005). European Union legislation is forcing all the tyre companies to recycle one tyre for each new tyre manufactured. Companies are capturing value from returned goods by reconditioning the products for reuse. They are targeting these refurbished and reconditioned products to those target customers who wants value for money (Guide Jr and Van Wassenhove, 2002; Blackburn *et al*., 2004). The product acquisition is the most important process to have an efficient reverse supply chain. The challenge is not just acquiring the products and disposing it off but refurbishing or remanufacturing to make it a value added product for secondary market (Hua, 2008). Product return rate and recoverable product value are having scale effects i.e., they impact the magnitude of the cost of reverse network and hence the profitability of the company (Daniel *et al*., 2006).

## RESEARCH OBJECTIVES OF THE STUDY AND RESEARCH QUESTIONS

The primary research objectives of the study were to analyze how manufactures and retailers adopted reverses supply to enhance customer satisfaction.

**Research questions:** The study focuses on following research questions:

**Research question 1:** Whether the retailers of different brands are satisfied with the products on different criteria like price, deliverability, availability, credit facility provided to them?

**Research question 2:** What are the reasons for returning goods by the retailers or customers?

**Research question 3:** Whether all the companies are providing replacement guarantee to their retailers?

**Research question 4:** What is the response of different companies towards returned goods?

**Research question 5:** What is the duration of holding returned goods by the manufacturers and their retailers?

**Research question 6:** What price discounts are offered to the customers if the customer is willing to take back returned goods?

## RESEARCH METHODOLOGY

The study was conducted with the retailers of Tantex hosiery products, a leading brand in Tamil Nadu, was compared with Viking, Anand and Poomex products, which the retailers were selling along with Tantex products. The primary data collection was done through survey method from retailers operating across Tamil Nadu's major cities like Trichy, Madurai, Salem, Coimbatore, Thanjavur, etc. Survey tool used were questionnaire and personal interview. Questionnaire

had closed ended and multiple choice statements with 5 point Likert scale rating. The questionnaire contained various components based on review of literature. The questionnaires were distributed to 125 retailers, 98 complete filled in questionnaires were collected. This is 78% response rate. Analysis of the collected data was done with help of frequency table and by calculating weighted average. Interviews to find out about the reverse supply chain policy were conducted with General Manager of the four companies chosen for the primary data collection. Findings were based on the data analyzed in collaboration to review of literature. Conclusion to the research questions was generated & suggestions for future researches were put forward.

## RESEARCH RESULTS AND DISCUSSION

**Research question 1: Satisfaction level for various brands:** Review of literature has stated that there are different factors which influence the customer satisfaction level. Perceived service quality, brand image, perceived product quality are the major influencing factors (Ikilem and Yesim, 2012; Ikilem *et al*., 2007). In the study when Tantex products were compared with Viking, Anand and Poomex, to find out satisfaction level on criteria like price, delivery, availability and the credit facilities provided to the retailers. After calculating weighted average, it was observed than satisfaction on price criteria was highest for Viking products followed by Tantex; on delivery aspects Tantex had highest satisfaction level followed by Poomex; on credit facility given to retailers, Tantex's retailers were most satisfied followed by Viking; but when it comes to overall satisfaction, retailers were most satisfied with Viking, followed by Tantex, then Anand and were least satisfied with Poomex (Table 1).

Table 1: Satisfaction level for various brands

| | TANTEX (Wt avg.) | VIKING (Wt avg.) | ANAND (Wt avg.) | POOMEX (Wt avg.) |
|---|---|---|---|---|
| Price | 4.30 | 4.59 | 4.12 | 3.65 |
| Delivery | 4.43 | 4.38 | 4.32 | 4.09 |
| Availability | 4.38 | 4.73 | 4.06 | 4.16 |
| Credit | 4.68 | 4.45 | 4.31 | 4.20 |
| Overall total | 17.79 | 18.15 | 16.81 | 16.10 |

Primary data

Table 2: Reasons for returning the goods

| | (%) | Valid (%) | Cumulative (%) |
|---|---|---|---|
| Product damaged in transport | 50 | 50 | 50 |
| Cancellation of sale order by customer | 30 | 30 | 80 |
| Product does not meet customer expectation | 10 | 10 | 90 |
| Customer found a better alternative | 10 | 10 | 100 |
| Total | 100 | 100 | |

Primary data

Table 3: Replacement warranty

| | (%) | Valid (%) | Cumulative (%) |
|---|---|---|---|
| Yes | 73 | 73 | 73 |
| No | 27 | 27 | 100 |
| Total | 100 | 100 | |

Primary data

Table 4: Response of different companies towards returned goods

| | (%) | Valid (%) | Cumulative (%) |
|---|---|---|---|
| Always willing | 85 | 85 | 85 |
| Sometimes willing | 12 | 12 | 97 |
| Never willing | 3 | 3 | 100 |
| Total | 100 | 100 | |

Primary data

Table 5: Frequency of goods returned from customers to retailers

| | (%) | Valid (%) | Cumulative (%) |
|---|---|---|---|
| Sometimes returned | 22 | 22 | 22 |
| Never returned | 78 | 78 | 100 |
| Total | 100 | 100 | |

Primary data

**Research question 2: Reasons for returning the goods:** The study revealed that the reasons for returning the goods to the manufacturer by majority of retailers/customers were because of the damages due to mishandling while transportation, which means that companies must take special care in packing the whole lot. Another reason was due to cancellation of sale order by customers, mainly as it did not meet customer's expectation (Table 2).

**Research question 3: Replacement warranty:** Research has proved that different manufacturers' warranty policy may differ for different product lines. The justification given was that the customer will any how return the product if it is not as per their satisfaction level. The manufacturer who is offering the warranty is to assure customers of quality or satisfaction. This policy will install pride and confidence in the mind of the customers (Kendall and Russ Frederick, 1975). Majority of the retailers received replacement warranties from all the manufacturers. Hence it is understood companies are taking initiative to give promise of replacement if goods are returned by the customers or are defective (Table 3).

**Research question 4: Response of different companies towards returned goods:** Retailers with higher customer orientation and higher conflict avoidance handles fuzzy return requests in more efficient and effortful manner (Sijun *et al*., 2012). Majority of retailers opined that they are always willing to take back the goods which are returned. They also opined that majority of customers are not coming back to the retailers for returning back goods even if they are not satisfied or the product is damaged (Table 4 and 5). This means that a retailer requires communicating to its customers about the conditions for return/warranty clauses.

**Research question 5: Duration of holding returned goods by retailers:** Majority of the retailers hold the damaged products for 1-3 months before disposing off

Table 6: Duration of holding returned goods by manufacturer and retailers

| | Manufacturers | | Retailers | |
|---|---|---|---|---|
| | (%) | Valid (%) | (%) | Valid (%) |
| Less than month | 33 | 33 | 10 | 10 |
| 1-3 month | 67 | 67 | 83 | 83 |
| More than 3 month | 0 | 0 | 7 | 7 |
| Total | 100 | 100 | 100 | 100 |

Primary data

Table 7: Price discounts if returned to customer

| | (%) | Valid (%) | Cumulative (%) |
|---|---|---|---|
| 20% | 33 | 33 | 33 |
| 30% | 67 | 67 | 100 |
| Total | 100 | 100 | |

Primary data

to the company, while the manufactures also retain it for another 1-3 months before recycling the damaged products (Table 6).

**Research question 6: Price discounts if returned to customer:** A discount of 20-30% is offered by manufacturer for the products which are reprocessed and send back to be sold in the market (Table 7).

## CONCLUSION

A business in this knowledge business world faces the challenge of return policies. In certain countries the manufacturers are forced to have a well defined reverse supply chain in accordance to environmental regulations. Organization through effective management of reverse supply can improve their process efficiencies, bring out a supply design which provides better customer satisfaction and bring down cost by refurbishing or remanufacturing which can be sold in secondary market leading to better returns from returned products. Most researches in reverse supply chain are based on review of literature. Huge opportunity exists to conduct an extensive survey based research to understand the current acceptability level of reverse supply in multiple industries specially in electronics, ink cartridge, tyers, etc. Extend of this study is only for hosiery industry but the model can be replicated for other industries to find out how Reverse Supply Chain is adopted by different companies. Manufacturers have realized that better reverse supply chain management leads to higher customer satisfaction resulting in higher revenue opportunity.

**Limitation of the study:** The study is narrowed down to one to few retailers in selected cities of one region. Generalization may not be appropriate as in some other regions the manufacturers and retailers view may differ.

**Future implications:** Study can be carried out in future to find product residual value? Benefits to the manufacturer on calling the product and refurbishing and selling them at a discount rate or as a new product can be taken up. Cost of re-calling, acquisition/ collection of products and refurbishing/remanufacturing the return goods to bring down the cost of return goods and strength the bottom line and develop a sustainable business.

**Originality/value:** There is growing numbers of review of literature relating to reverse logistics and its framework. Research reports are also presented on different products but there is little work done in terms of hosiery products. Having reviewed the literature the researchers' empirical results in this area will address to academic and industry discourses.

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