JKIJMSS
@JK Business School
Vol. 4 Issue No.1 & 2 November 2021
Pages: 1-9
ISSN 2581-7337
https://www.jkbschool.org/research-journals/

REVERSE LOGISTICS IN 21 ST CENTURIES IN SPECIAL REFERENCE TO SUPPLY CHAIN DISRUPTIONS DURING COVID-19

Vikram Tyagi
Professor, Logistics and Supply Chain Management
J.K. Business School, Gurugram
vikram.tyagi @jkbschool.org

ABSTRACT
Issues related to supply chain and reverse logistics based on various volatile environmental factors have drawn the attention of researchers quite often, which is evident in the form of scholarly publications on the topic. This review paper has been conceptualised after doing a thorough review of available published literature in this area. The paper intends to chalk out a framework that can prove helpful in carrying out future research in this domain. A total of 150 articles published between the year 1995 and 2020 were reviewed and analysed. Important issues such as e-waste disposal, green logistics, close-loop logistics, application of technology in reverse logistics and strategic options for finding optimal reverse logistics solutions have been examined. Thus, the gaps identified after this review present the research gaps that can be filled by researching the near future. Recently, a few pieces of research have been carried out on reverse logistics after the outbreak of COVID-19, which finds mention in this paper. These studies provide a direction to the e-retailers so that they may gear themselves up for facing any similar situations in times to come.

Keywords: supply chain, reverse logistics, COVID-19

INTRODUCTION
Purchased products have to be delivered to the customers. “A supply chain, in its classical form (forward supply chain), is a combination of processes to fulfil customers’ requests and includes all possible entities like suppliers, manufacturers, transporters, warehouses, retailers, and customers themselves” (Chopra and Meindl, 2010). Sometimes, purchased 1products have to be collected from the customer; the process is known as reverse logistics. According to the American Reverse Logistics Executive Council, reverse logistics is defined as “The process of planning, implementing, and controlling the efficient, 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 value or proper disposal” (1999). Product returns can be of five different types: customer returns, repair/service returns, end of life returns, reusable container returns, and leased product returns. Every kind of return requires somewhat different types of the reverse logistics process. Reverse logistics has significant commercial, social and environmental implications for sellers, customers and society at large.

Types of returns and broad options to extract value are shown in Fig.1

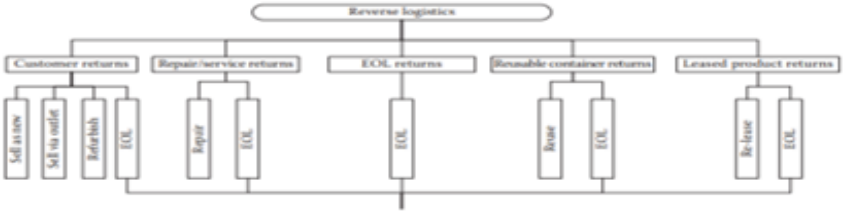

Fig.1:Adopted from the book, Reverse Supply Chains- issues and analysis; Gupta al et. P.6

During the process of using a product by the customer, it may be consumed completely or extract the intended value out of the product. We may call this end of (useful) life of the products. However, by using an appropriate reverse logistics process, the left-over value can be extracted or disposed of in a way and manner to avoid adverse social or environmental impact. Therefore, end of life returns needs a different kind of treatment.

Broad options for the disposal of such products are shown in Fig. 2 shows.

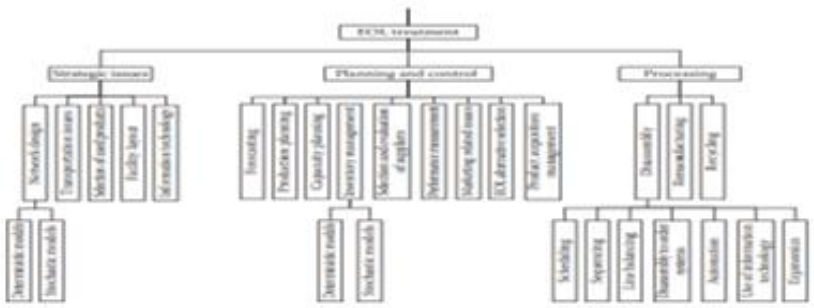

Fig.2: Adapted from the book, Reverse Supply Chains- issues and analysis; Pochampally & Gupta

In forward logistics, new products produced in a facility are transported to many distributors or customers. In reverse logistics, the returned products collected from many customers or collection centres for transporting to the producer or to a product recovery facility can involve refurbishing, remanufacturing, recycling, or final disposal. It means the transportation flows in the forward supply chain are one-to-many, while in reverse logistics, it is re many-to-one.

These well-established models of the supply chain need a relook in the given situation of pandemic COVID-19 as a similar situation may occur in the future also. Moreover, the retail industry has seen a drastic shift of consumers from brick and mortar purchases to online shopping. The trend may continue in the future also.

This literature review paper is focused primarily on two types of returns: customer returns and end of life type of returns. We would also analyse research work from the perspective of implications for E-retailers, Consumers, Reverse logistic system design, and recent changes in reverse logistics after the onset of COVID-19.

Methodology

Mayring (2003) the research methodology of a review paper should ideally be based upon content analysis and description, including a four-step process: a collection of papers, descriptive analysis, selection of category, and material evaluation. This paper is essentially based on these four steps for carrying out the review of literature, analysing and presenting it.

Collecting papers

The process involved going through the research and review papers available by using the 3search words' reverse logistics', 'reverse logistics, E-retailing' Covid-19, using the Google search engine and EBSCO database.

REVIEW OF LITERATURE:

1. Implications for E-retailers:

Reverse logistics is crucial as it directly impacts the bottom line (Stock, 1998). Kumar and Chatterjee (2011) found that during the process of collecting rejected products, about 45% of value is lost. Therefore, efficient management of reverse logistics is vital for the profitability of a company. According to (Bernon et al., 2011) more liberal return policies result in more customer product return products. Therefore, efficient management of reverse logistics requires an appropriate return policy.

According to (**Yabalik, Petruzzi & Chhajed, 2005; Bernon et al., 2011**), "E-retailing involves a significant level of risks and its reverse logistics need to be properly managed as an integral part of supply chain activity." According to (**Richey et al., 2005**), "Managerial aspects of reverse logistics are not the same as in forward logistics; therefore, it deserves special attention, and firms should focus on innovative ways of handling the reverse issue."

According to (**Bernon et al., 2011**), "Effective reverse supply chain management can enhance customer value and reduce operating cost."

Rejected products have to be collected and consolidated efficiently. In the absence of proper functioning of this part of the operation, it may have a severe adverse effect on the entire value chain. According to (**Bernon et al., 2011**), "Proper implementation of return process enables management to identify opportunities of reducing unwanted return and control reusable assets."

Due to changes in how E-commerce activities are taking place, "firms need to prioritise reverse logistics as an effective tool in achieving cost reduction, customer satisfaction and loyalty and competitive advantage (**Bernon et al., 2011; Tibben-Lembke, 2002**)." For an extended period, the researcher's attention has been on logistics; recently, there has been growing interest in reverse logistics with attention on online-retailing reverse logistics According to (**Fang, 2007**) "."

According to (**Harridge-March, 2006**), "Despite the increase in E-retailing growth, risk of return handling is a hindrance against customer patronage, and it has an effect on E-retailer and customer satisfaction."

According to **Xu and Jiang (2009)**, "rapid growth in internet retailing has brought profound changes to the economy, businesses and society at the large and rapid growth in online business, e-retailer has to cope with an alarming rate of product returns." A high rate of product rejections and returns indicates the possibility of a much bigger problem such as the quality of products (**Kolsaker and Payne, 2002**). Reverse logistics constitute most significant operational challenges to e-retailer because of return volume and processing associated cost."

Daugherty et al. (2002), says "reverse logistics can be used in achieving competitive edge as explained by Porter's theory of competitive advantage."

Schatteman (2001) emphasised that product returns require the participation of customers, third-party logistics service providers and sellers, and, size of returns cannot be predicted; E-retailers have to evolve a particular system for this purpose. According to (**Prahinski and Kocabasoglu, 2005**), "Through the implementation of efficient reverse logistics, E-retailer can commendably manage after-sales service, supply chain design, product life cycle design, and entire supply chain efficiency."

According to **Schatteman (2001)**, one of the most vital aspects of an E-retail business is to design a return policy that is considered reasonable and acceptable by the customers and develop an effective system of collecting rejected products. According to (**Rogers and Tibben -Lembke,1999**), a "Significant proportion of managers do not attach importance to reverse logistics." (**Tibben-Lembke, 2002**) stated that "Reverse logistics is a vital facet of the supply chain that is growing and could help

firms in achieving competitive advantage over others." Many firms discovered that improving their reverse logistics process is an additional value-adding activity (**Subramaniam et al., 2004**).

According to (**Yoo et al. 2010; Prahinski and Kocabasoglu, 2005**), "Reverse logistics implementation is not to achieve cost reduction alone, but to create revenue and expand customer goodwill, environmental regulation and reduce the cost of product disposal."

Carter and Ellram (1998) effective management of reverse logistics has numerous benefits. "It provides an opportunity for value reclamation, the new method of revenue generation, contribute positively to related environmental issues, promote long-term relationship, help in achieving market differentiation and competitive advantage." According to (**Mollenkopf et al., 2007**), the success of E-retailer operation can be directly linked to return handling."

According to **Nasir (2004)**, "The increase in many online customers has witness growth in customer complaint resulting in product return." (**Elmas and Erdogmu, 2011**) stated that "Reverse logistics implementation could be considering as innovative service of a company portfolio and it is becoming an area of competitive advantage." According to (**Kokkinakiet al., 1999**), "Efficient handling of product return can lead to a reduction in costs, acquisition of market advantage, an increase in profits, and improve customer service." (**Kokkinaki et al., 1999**) emphasised that "efficient reverse logistics can capture value from products re-usage or recycling."

Amazon has been successful in reducing response time and build customer loyalty by intensive use of technology such as Kiva Systems, AWS, Amazon Web Services. By effective return handling, e-retailer can develop strategies that could position them in the market better than the competitor. According to **Smith (2005)**, "Efficient products return handling is powerful tools which can be used to get a competitive edge in the marketplace as well influence re-purchase decisions of customers." **Stock et al. (2002)** state that "Coherent return handling has the capability of improving e-retailer and customer relationship. Return handling permit e-retailers to assess the effectiveness of its return instruction and determine further corrective measures. When customer failed to follow stipulated return instructions, it
could cause a delay in payment refund."

"Products return indicate prospect to recapture substantial proportion of value from the product, while refund policies serve as a guarantee for customer repeated purchases **Mollenkopf et al., (2007)**. The return process handling has an impact on company turn- 6around time, credit issuance, refund issuance, customer satisfaction and as well reflect on customer service programs. Effective return handling could enhance e-retailer and customer relationship."

2. Implications for Consumers

According to **(Permenter, 2012)** "Negative customer experience on return handling could adversely affect e-retailer corporate and brand image.". Shoppers have a significant influence on peers; therefore, E-retailer should focus on them as a critical link in the reverse logistics chain.

According to **Naumann (1995)**, "E-retailer offering efficient reverse logistics has the potential to grow and become a successful business enterprise." As per the study by **Li and Wang, Fang (2007)**, "Customer satisfaction has a significant impact on customer loyalty; therefore, E-retailers must implement programs that offer desired satisfaction. There is the increasing belief that E-retailer with effective and efficient customer service program tends to gain customer commitment and loyalty as a reward."

According to **Elmas and Erdogmu (2011)**, "Providing quality products to the customer is not sufficient in differentiating an E-retailer from others, but is achievable through the provision of a good design and successfully after purchase customers' services that can become an integral part of the corporate organisation strategy."

According to **(Kolsaker and Payne, 2002)**, "Reverse logistics has demonstrated that the field is specialised enough to have its department with specialised skills. Reverse logistics department must continuously gather feedback from customers to improve their overall experience."

According to **Fang (2007)**, "Customer satisfaction has a significant impact on customer loyalty; therefore, E-retailer must implement a customer program that offers desired satisfaction. There is the increasing belief that E-retailer with effective and efficient customer service program tends to gain customer commitment and loyalty as a reward." Therefore, to become a growth-oriented and successful E-business enterprise, they have to offer effective reverse logistics services. **Boyer (2005)**; **Rabinovich, (2004)**; and **Xu et al. (2009)** pointed out that "perceived quality of reverse logistics influences customer satisfaction." **Francis (1994)** 7expressed that "Due to the importance of reverse logistics, return management should be given top priority."

Reverse logistics involves four key interrelated activities: Cancellation, Refund, Product exchange and Return collection. These have significant implications for E-retailers as well as customers. Customers expect quick return collection and refund of the amount paid within a short period. Any delay in this causes customer dissatisfaction resulting in customer switching to alternative E-retailer.

Brito & Dekker (2003) identified three driving forces of reverse logistics; legislation, economics and corporate citizenship. The three drivers are also interlinked, and boundaries are sometimes blurred, and reverse logistics is often carried out for a mix of motives. **[Dowlatshahi, (2010); Brito & Dekker, (2003)]** in their study found that a wide range of benefits accrue to the organisation that practice reverse logistics. **(Dowlatshahi, 2005; Autry, 2005)** found that Reverse logistics strategy is of critical importance in managing the reverse direction in supply chains–from consumer to producer–which counts for 1/5 in some industries.

A firm should develop logistics strategy on its core competencies to reduce costs and maximise its value offer **[(Olavarrieta & Ellinger, 1997; Dowlatshahi, 2000; Wong and Karia, 2010; Ramírez et al. 2011)]**

Hazen et al. (2012) suggested that consumers' satisfaction with green reverse logistics leads to increased levels of loyalty to the firm. Consumer loyalty may improve profits through reduced consumer acquisition costs and lower price sensitivity, and higher price tolerance **Reichheld and Teal, (1996). Ramanathan (2011)** examined the relationships between the performance of companies in handling product returns and customer loyalty and found that handling product returns play a significant role in shaping customer loyalty for low-risk products.

RESEARCH GAPS

Since the pandemic COVID-19 is an unprecedented situation that occurred all of a sudden and took the entire retail industry by stride, not much research has been conducted in this area as of now. Whatsoever researches have been carried out since March 2020 to date have been meticulously gone through and included in this paper. If similar pandemic outbreaks in 8the future, the retail industry should be prepared well in advance. This review paper will provide essential details that should be looked into by the e-retailers.

3. Implications of reverse logistics during COVID-19

DeAngelis, S. (2020) e-commerce boomed during the gloomy period of the pandemic COVID-19 as the brick and mortar stores were closed down, and the consumers were mostly dependent on online shopping for fulfilling their daily requirements. This immediate shift in the purchase habits of the consumers demanded a resilient supply chain of online stores. **Hitendra Chaturvedi,** a professor at

the Supply Chain Department of W.P. Carey School of Business at Arizona State University, writes, "The corona virus has disrupted U.S. companies in many ways, and nearly three-fourths of them have seen their supply chain significantly affected."

According to the SRS Media analysts, "With the significant growth in e-commerce purchases, there will be an inevitable increase in returned items." Average return rates of online orders are 30 per cent, compared to 8.89 per cent in brick-and-mortar stores. Therefore, reverse logistics companies are preparing for managing the influx of returned or replaced items during this time." The returns are costing the e-commerce companies a fortune. Now, with the advent of newer strategies like "buy now pay later" or zero EMI options, or easy returns, the consumers are very much comfortable to buy a product and return it as per their whims and fancies.

Another great challenge that came the way of e-commerce companies is to protect their employees from Corona virus, which is said to stay on cardboard surfaces for approximately 24 hours and plastic and steel surfaces for 2-3 days. In the case of managing reverse logistics, these issues become very crucial. The companies have to spend additionally on the generous supply of hand sanitizers, gloves and masks for the safety of their workforce, as of now managing the safety of the products (**SRS Media, 2020**).

This shift in the purchase habits of the consumers reflects that they will continue to buy online even after the passage of this pandemic. Hence the e-retailers need to manage the reverse logistics very efficiently from now onwards. Four aspects need to be strengthened by the e-retailers: First, as to how the returns are transported, secondly, how they are processed safely, which includes safety measures against the virus in addition to inspection for any damage or theft by the consumer, thirdly it is the reintegration of the returned item back in 9the supply chain after refurbishing and repackaging it, and lastly, it is tracking everything. The e-retailers can also partner with each other for optimising their shipping costs.

Deloitte (2020) the pandemic has added to the woes of COVID-19. The entire chain of reverse logistics was almost disrupted for quite some time. The e-retailers having sound and efficient reverse logistics management mechanism will only survive in the e-retail market in times to come.

Singh et al. (2020) the pandemic has badly affected the world economy. Due to lockdown, manufacturing was adversely affected. The logistics and supply chain also faced the brunt. It influenced the demand and supply scenario, thus affecting the retailers and shopkeepers of different sectors.

Archana et al. (2020). During the pandemic COVID-19, almost all industries worldwide are facing a financial crisis, especially the retailers. There have been significant disruptions in the supply chain.

REFERENCES

1. Archana, M. S., Kavya, C., & Prathiksha, B. (2020). Supply Chain Disruptions Due to Pandemic- A Case Study Paper on the Recent Pandemic Covid 19. *International Journal of Innovative Science and Research Technology*, 5(7)

2. Michael, B., Silvia, R., & John, C. (2011). Retail reverse logistics: A call and grounding framework for research. *International journal of physical distribution and logistics management*, 41(5), 484-510.

3. Boyer K. K. (2005) "Extending the supply chain: Integrating operations and marketing in the online grocery industry", Journal of Operations Management, 23(6), 642.

4. Brito, (de) M.P., & Dekker, R. (2004). A framework for reverse logistics. In Dekker, R., Fleischmann, M., Inderfurth, K., & Van Wassenhove, L.N. (Eds.), Reverse logistics: quantitative models for closed-loop supply chains (10-20). Berlin, Germany: Springer-Verlag.

5. Carter, C. R., & Ellram, L. M. (1998). Reverse logistics: a review of the literature and framework for future investigation. *Journal of Business Logistics*, 19(1), 85-102.

6. Daugherty P. J., Myers M. B., & Richey R. G. (2002). Information support for reverse logistics: the influence of relationship commitment. *Journal of Business Logistics*, 23(1).

7. DeAngelis, S. (May 15, 2020). The Impact of the Coronavirus Crisis on Reverse Logistics.

8. Dowlatshahi, S. (2010). A Cost-benefit analysis for the design and implementation of reverse logistics systems: Case studies approach. *International Journal of Production Research*, 48(5), 1361-1380.

9. Dowlatshahi, S., (2000) Developing a theory of reverse logistics, Interfaces, Vol. 30, No. 3, pp. 143–155.

10. Dowlatshahi, S., (2005). A strategic framework for the design and implementation of remanufacturing operations in reverse logistics, *International Journal of Production Research*, 43(16), 3455–3480.

11. Elmas Guldem & Erdogmu, Fevzi (2011). The importance of reverse logistics. *International Journal of business and management studies*, 3(1).

12. Fang Wang, Milena Head. (2007). How can the Web help build customer relationships? *Information & Management*, 44(2), 115-129.

13. Francis J E. (1994). "Internet retailing quality: One size does not fit all", Journal of Managing service quality, Vol. 17, No.3, pp.341-355.Gehin, A., Zwolinski, P., &Brissaud, D. (2008). A tool to implement sustainable endof-life strategies in the product development phase. *Journal of Cleaner Production*, 16(5), 566–576

14. Harridge-March Sally. (2006). Can the building of trust overcome consumer perceived risk online. *Journal of marketing intelligence and planning*, 24(7), 746-761.

15. Chaturvedi, H. "How Companies can Rethink Supply Chains to Deal with Disruptions," Global Trade, 2 April 2020.

16. Kocabasoglu, C., Prahinski, C., & Klassen, R. D. (2007). Linking forward and reverse supply chain investments: The role of business uncertainty. *Journal of Operations Management*, 25(6), 1141–1160.
17. Kokkinaki A. I., Dekker R., Nunen J. van, &Pappis C. (1999) "An Exploratory study on electronic commerce for reverse logistics", Econometric Institute report EI-9959/A.

18. Kolsaker, A., & Payne, C. (2002). Engendering trust in e-commerce: A study of gender- based concerns. *Journal of Marketing intelligence and planning*, .20(4), 206- 214.

19. Kumar, N., & Chatterjee, A. (2011). Reverse supply chain: Completing the supply chain loop. Cognizant 20-20 insight.

20. Mollenkopf, D. A., Rabinovich, E., Laseter T. M., & Boyer K. K. (2007) "Managing Internet Product Return: A Focus on Effective Service Operations", *Journal of Decision Sciences*, 38(2), 215.

21. Nasir V. Aslihan (2004) "E-consumer complaints about online stores", *Journal of consumer satisfaction, dissatisfaction and complain behaviour*, 17. 11

22. Naumann Earl, (1995). "Creating customer value: The linkage between customer value, customer satisfaction, customer loyalty, and profitability", A white paper.

23. Olavarrieta, S., & Ellinger, A.E., (1997) Resource-based theory and strategic logistics research, *International Journal of Physical Distribution & Logistics Management*, 27(9/10), 559 – 587.

24. Permenter Kevin (2012) "Reverse Logistics helping to push companies forward" supply chain management: http://blogs.aberdeen.com/supply-chain-management/reverse-logistics-helping-to-push-companies-forward/

25. Pochampally, K.K. and Gupta, S.M. 2009. Reverse supply chain design: A neural network approach. In Web-Based Green Products Life Cycle Management Systems: Reverse Supply Chain Utilization, H.-F. Wang (ed.). Hershey, PA: IGI Global Publication.

26. Prahinski Carol &KocabasogluCanan (2005) "Empirical research opportunities in reverse supply chain", *International Journal of management science*, Vol. 34 pp. 519-532

27. Ramanathan, Ramakrishnan, (2011). An empirical analysis on the influence of risk on relationships between handling of product returns and customer loyalty in E-commerce. *International Journal of Production Economics*, 130(2), 255-261.

28. Retrieved on December 4, 2020 from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/process-and-operations/reverse-logistics-pov.pdf

29. Retrieved on December 5, 2020 from https://www.enterrasolutions.com/blog/the-impact-of-the-coronavirus-crisis-on-reverse-logistics/

30. Richey, R.G., Chen, H., Genchev, S.E., & Daugherty, P.J.: Developing Effective Reverse Logistics Programs. *Industrial Marketing Management*. 34 (2005) 830-840

31. Rogers, D. S, &Tibben-Lembke, R. S. (1999) "Going backwards: reverse logistics trends and practices", University of Nevada, Reno, Center for Logistics Management.

32. Schatteman Olaf (2001) "Reverse logistics", online. Available at: http://www.ashgate.com/pdf/SamplePages/ghsupplych2.pdf, [10.12.2012].

33. Smith Alan D. (2005) "Reverse logistics programs: gauging their effects on CRM and online behaviour", *Journal of information and knowledge management systems*, Vol. 35, No. 3, pp. 166-181.
34. SRS Media, "COVID-19: How is this affecting reverse logistics?" Sims Lifecycle Services, 17 April 2020.

35. Staff, "What is Reverse Logistics?" GoShare, 18 July 2019.

36. Stock, J.R, Speh, T.W., & Shear, H.W., (2002) "Many happy return", *Harvard Business Review* (80: 7), pp. 16-17.

37. Singh, S., Kumar, R., Panchal, R., & Tiwari, M.K. (2020). Impact of COVID-19 on logistics systems and disruptions in food supply chain. *International Journal of Production Research*, DOI: 10.1080/00207543.2020.1792000

38. Subramaniam, U., J. Bhadury, & S. Peng (2004). Reverse Logistics Strategies and Their Implementations: A Pedagogical Survey. *Journal of the Academy of Business and Economics*, 4(1), 169-173.

39. Chopra, S. & Meindl, P. (2010). Supply Chain Management: Strategy, Planning, and Operation; Pearson Education Inc.

40. Tibben-Lembke R.S., & Rogers, D.S.: Differences Between Forward and Reverse Logistics in a Retail Environment. Supply Chain Management. 7(5) (2002) 271-282.

41. Tibben-Lembke Ronald S. (2002). Life after death: Reverse logistics and the product life cycle. *International journal of physical distribution and logistics management*, 32(3), 223- 244.

42. utry, C.W. (2005) Formalisation of reverse logistics programs: A strategy for managing liberalised returns., *Industrial Marketing Management*, 34(7), 749-757.

43. Wang, I.L. & Yang, W.C. (2007). Fast heuristics for designing integrated e-waste reverse logistics networks. IEEE Transactions on Electronics Packaging Manufacturing 30 (2),147–154.

44. Wang, M., Chen, C, Chang, S., & Yang, Y. (2007). Effects of online shopping attitudes, subjective norms, and control beliefs on online shopping intentions: A test of the theory of planned behavior. *International Journal of Management*, 24(2), 296302.

45. Xu Jian & Jiang Yue (2009). Study of reverse logistics in the E-commerce environment. *Journal of International business research*, 2(1).

46. Yabalik B., Petruzzi, N.C., & Chhajed, D. (2005). An integrated product return model with logistics and marketing coordination. European Journal of operation research, 161(1).