CHAPTER 2

REVIEW OF LITERATURE
2. REVIEW OF LITERATURE

This chapter reviews theories and methodologies underlying three variables of the study i.e. reverse logistics capabilities, value and claiming back strategies. The review and discussion will focus on developing hypotheses for this study based on the research objectives of the study.

2.1 REVIEW

The main objective of Patricia, Chad and Alexander’s (2001) research was to study the relationship between resource commitments to reverse logistics and reverse logistics program performance in resource commitment. In reverse logistics they consider two things first management resource commitment to reverse logistics, second was financial resource commitment to reverse logistics and their effect on reverse logistics program performance. In reverse logistics program performance they consider six things including improved customer relations, environmental regulatory compliance, cost containment, improved profitability, recovery of assets (products) and reduced inventory investment and their effect on overall effectiveness of reverse logistics program. For this they conducted research on 212 catalog retailers selling electronics products and their results revealed that there is a significant correlations where management resource commitment was found for four of the six reverse logistics program performance objectives namely, management resource commitment which was most strongly correlated with environmental regulatory compliance and other were reduced inventory investment, improved profitability and recovery of assets. Another result revealed that there was only one of the reverse logistics program
performance objective out of six i.e. environmental regulatory compliance was significantly correlated with financial resource commitment and finally all the six of the reverse logistics program objectives were significantly correlated with overall effectiveness of the reverse logistics program.

**Eric, Thomas and Lauren (2010)** studied customer orientation, customer opportunism, increased levels of resource commitment and contractual arrangement and reverse logistics capabilities. They tried to find out whether reverse logistics capabilities were related to reverse logistics cost savings. For this they conducted a research on 1429 respondent’s and tools that they applied for the purpose of data analysis were reliability, validity, EFA, CFA, SEM and Multiple Regression. The results reveal that customer orientation was not significantly related to reverse logistics capabilities but customer opportunism, increased levels of resource commitment and contractual arrangements were significantly related to reverse logistics capabilities and reverse logistics capabilities were also significantly related to reverse logistics cost savings. They also performed a post hoc analysis to evaluate how reverse logistics capabilities mediated the relationship between the reverse logistics cost savings. Furthermore, results revealed that out of four antecedents (customer orientation, customer opportunism, resource commitment and contractual arrangements) resource commitment, contractual arrangements and cost savings were partially mediated by reverse logistics capabilities but for customer orientation reverse logistics capabilities was not a mediator.

An interesting research in the similar context was proposed by **Patricia, Matthew and R. (2002)**. The main objectives of their research were to study the relationship
between information system support and reverse logistics program performance. In information system support they included three things mainly, capability, compatibility and technologies. Reverse logistics program performance was assessed on the basis of operating/financial performance and satisfaction. Their second objective was to study the moderating effect of relationship commitment in between the relationship of information systems support and reverse logistics program performance. For this they conducted a research on 71 respondents from electronic segment and their results revealed that operating/financial performance and satisfaction of reverse logistics program was not directly influenced or explained by information systems support capability, compatibility and technologies. Another results revealed that relationship commitment was a significant moderator between operating/financial performances of reverse logistics program and information system support capability and compatibility. In the research, relationship commitment was not a significant moderator between satisfaction of the reverse logistics program and information system support capability, additionally, in compatibility and technologies also relationship commitment was not playing a role of significant moderator between operation/financial performance of reverse logistics program and information system support technologies.

In an interesting study R., Mert, Robert and Michael (2005) developed a reverse logistics monitoring system for controlling reverse flows of materials through marketing channels in emerging economies. For this they introduced partner control framework and developed scales for the better understanding and effective management of global reverse logistics networks. They also found the common
reverse logistics activities in case of products returned to supplier, resold, sold via outlet, salvaged, reconditioned, refurbished, remanufactured, reclaimed materials, recycled and landfill and in case of packaging reverse logistics activities such as reuse, refurbish, reclaim, materials, recycle and salvage. They also developed three models first one was a model of environmental irresponsibility in emerging markets by studying the impact of social irresponsibility on network relations in the absence of a reverse logistics program, second one was a model of environmental responsibility by studying the impact of social responsibility on network relations the presence of a reverse logistics program and finally they came out with third model of global reverse logistics monitoring framework model.

Furthermore Ho, Choy, Lam and Wong (2012) tried to determine factors influencing implementation of reverse logistics. They have framed nine hypotheses in their study. The hypotheses were: the size of a company influences the implementation of reverse logistics, the business field influences the implementation of reverse logistics, the roles in supply chain influence the implementation of reverse logistics, the degree of recognition influences the implementation of reverse logistics, the degree of perception influences the implementation of reverse logistics, the finance and resources of a company play an important role in the implementation of reverse logistics, the human resource of a company play an important role in the implementation of reverse logistics, business partners play an important role in the implementation of reverse logistics of a company and the government play an important role in the implementation of reverse logistics. The results of their study revealed that out of nine hypotheses only five hypotheses were supported viz; the size
of a company influences the implementation of reverse logistics (positive relationship); the degree of perception influences the implementation of reverse logistics (positive relationship); the finance and resources of a company play an important role in the implementation of reverse logistics (positive relationship); the human resource of a company play an important role in the implementation of reverse logistics (positive relationship) and business partners play an important role in the implementation of reverse logistics of a company (positive relationship) and remaining four hypothesis were rejected. On the other hand a qualitative research was conducted by A., Thomas and Cyril (2002). The purpose of their study was to find out factors affecting reverse logistics systems by qualitative examination and to report the value of qualitative examination. They identified underlying factors of reverse logistics system to recycle and/or refurbish end of life computers. They conducted in depth interviews to find out the needs of stakeholders. Their results revealed that they categories the factor in two category first one was external considerations which include input sector, regulatory sector, output sector and competitive sector second was international considerations which include strategic factor and operational factors.

In a distinct research Daugherty et al. (2005) studied relationship between various variables. The main objectives of their research were to study the relationship between commitment of resources to a firm's reverse logistics program and the reverse logistics economic performance, to study the relationship between commitment of resources to a firms reverse logistics program and reverse logistics service quality, to study the relationship between commitment of resources to a firms reverse logistics program and information technologies capabilities, to study the relationship between
information technologies capabilities and reverse logistics economic performance and to study the relationship between information technologies capabilities and reverse logistics service quality. For this they conducted the research in automobile segment on 118 individual companies and the results revealed that the relationship between all the variables were insignificant. In other words commitment of resources to a firms reverse logistics program was not related to reverse logistics economic performance, reverse logistics service quality and information technologies capabilities. Similarly, information technologies capabilities were also not related to reverse logistics economic performance and reverse logistics service quality.

Similarly, R., Stefan and Patricia (2005) studied the relationship of resource commitment and other variables of reverse logistics. The objectives of their study were to study the relationship between resource commitment to reverse logistics/returns handling and innovative reverse logistics capabilities; to study the relationship between reverse logistics capabilities and enhanced strategic performance; to study the relationship between reverse logistics capabilities and operational responsiveness and to study the relationship between innovative reverse logistics capabilities and operational service quality. The results of their study revealed that the relationship between resource commitment to reverse logistics/returns handling and innovative reverse logistics capabilities were found to be significant and they were positively related to each other, the relationship between reverse logistics capabilities and enhanced strategic performance were not found significant hence they were not related to each other, the relationship between reverse logistics capabilities and operational responsiveness were found significant and they were positively related to
each other and finally the relationship between innovative reverse logistics capabilities and operational service quality were also found significant and they were positively related to each other.

**Pilar, Marian, Joseph and Belarmina (2010)** found the barriers to the implementation of environmentally oriented reverse logistics in automotive industry sector. During their literature review they find out broadly that many researcher classify the barriers in to two categories viz; industry specific or external barriers and organizational or internal barriers. Industry specific or external barriers include high cost of the process of environmental adaptation (new machinery certification), uncertainty regarding obtained results, defective industrial infrastructure, inappropriate environmental regulations on the part of government, reluctance on the part of different social actors, perception of a poorer quality product and lack of awareness concerning reverse logistics; organizational or internal barriers include scant commitment of workers (lack of training and qualifications), inappropriate organizational structure, lack of commitment on the part management (lack of planning), technological competence, lack of information and technological systems and lack of support from the supply chain. Out of this they considered only five items of industry specific or external barriers namely; reluctance on the part of government, customer reluctance, reluctance on the part of social actors, reluctance on the part of competitors and perception of a poorer quality product and in case of organizational or internal barriers only four items which were lack of know-how, lack of top management commitment, lack of information and technological system and high cost in financial and human resources. Further they applied CFA on the barriers and results
of CFA revealed that in industry specific or external barriers finally three items were converged which were reluctance on the part of government, customer reluctance and reluctance on the part of social actors and in case of organizational or internal barriers all four items were converged. Further SEM between reverse logistics, industry specific or external barriers and organizational or internal barriers was applied and the results of SEM revealed negative relationship between variables. For example, industry specific or external barriers were negatively related to reverse logistics, organizational or internal barriers were negatively related to reverse logistics and industry specific or external barriers were also negatively related to organizational or internal barriers.

R., Patricia, Stefan and Chad (2004) discovered the impact of timing and resource reverse logistics and the objectives of their study were; to study the relationship between timing of reverse logistics program introduction and program responsiveness, quality and economic performance; to study the moderating effect of resource commitment on the relationship between timing of reverse logistics program introduction and reverse logistics program responsiveness; to study the moderating effect of resource commitment on the relationship between timing of reverse logistics program introduction and reverse logistics program quality; to study the moderating effect of resource commitment on the relationship between timing of reverse logistics program introduction and reverse logistics program economic performance; to study the relationship between reverse logistics responsiveness and firm economic performance; and to study the relationship between reverse logistics quality and firm economic performance. The results of their study revealed that the relationship
between timing of reverse logistics program introduction and program responsiveness, quality and economic performance were insignificant hence there was no relationship between them. The results further revealed that there was a moderating effect of resource commitment on the relationship between timing of reverse logistics program introduction and reverse logistics program responsiveness, however, there was no moderating effect of resource commitment on the relationship between timing of reverse logistics program introduction and reverse logistics program quality. The results also revealed that there was a significant moderating effect of resource commitment on the relationship between timing of reverse logistics program introduction and reverse logistics program economic performance. The relationship between reverse logistics responsiveness and firm economic performance were found significant and they were positively related to each other and the relationship between reverse logistics quality and firm economic performance were also found significant and they were positively related to each other.

*Kroon and Vrijens (1995)* discussed that design of a network for reusable containers. The issues addressed by them were from the different sectors, the economies of the systems, the costs allocation to the different sectors, the amount of containers needed, and the logistics of the depots for the containers.

*Del Castillo and Cocharn (1996)* studied that integral planning of production, product distribution and collection of reusable containers used for distributing the products. They apply their model to the reusable bottles used by a soft drink company in Mexico.
De Koster et al. (2001) studied that comparison of the return handling operation of three food retailers, three department chains and three mail order companies. He focused Dutch nationwide network for the collection and processing of white goods, paying special attention to big white goods like refrigerators. Buyers of the new white goods have to pay disposal fee, which is used for financing the network.

Krikke et al. (1999a) The authors examined the economic consequences of two alternative locations for the remanufacturing facility one coinciding with the location of the manufacturing facility and other one in a cheap labour country.

Meijer (1998) discussed canon’s remanufacturing network for printers, scanners, copiers and faxes in the Netherlands, Belgium and Luxemburg. In which he designed a model and he suggested the model to the companies for their betterment. Van Burik (1998) described that Dutch nationwide network for dealing with car wrecks. Car manufactures, importers, car recyclers and other parties together established a special organization called Auto Recycling Netherlands (ARN) to fulfill legal requirements. Barros et al. (1998) discussed that network for the recycling of sand from building waste in the Netherlands. Because the Dutch government aims to increase the percentage sand that is recycled, from 70% at the moment to 90% in the near future, a group of construction waste processors wants to improve the sand recycling network, by the number and location of depots where the sand is stored waiting to be recycled and the depots where the actual recycling take place.

Kleineidam et al. (2000) considered that structure of the recycling network of the paper industry in the Netherlands. Companies selling paper and cardboard to the
Dutch market, setup the Dutch Paper Recycling Cooperation. This cooperation takes care of the collection of paper, its processing into pulp that is the raw material for the paper industry. The authors focused on the network for the collection of paper from households run by nonprofit organizations. The authors study the dynamic behavior the network, analyzing the consequences of incineration costs and paper taxes.

Chang and Wei (2000) discussed that location of the recycling drop-off stations in the recycling network for household waste in the city of Kaohsiung in Taiwan for which the Environmental Protection Bureau of the city is responsible.

Del Castillo and Cocharn (1996) studied production and distribution planning for products in reusable containers. Their model includes transportation of empty containers back to the plants. Availability of empty containers is modeled as a resource constraint for the production of the original product. The model is applied to a case study of a soft drink company using returnable bottles.

Toktay et al. (2000) considered inventory management for kodak’s single use cameras. As the camera acts as a container for the film, one may see this also as a distribution case. Printed circuit boards for the production of these cameras are either bought from overseas suppliers or remanufactured from the cameras returned by the customers via photo laboratories. The issue is to determine a cost efficient order policy for the external suppliers. Major difficulties arise from the fact that return probabilities and the market sojourn-time distribution are largely unknown and difficult to observe. The authors propose a closed queuing network model to address these issues. They asses the importance of information on the returns for the control of the network
Fleischmann (2000) described that dismantling of returned, end-of-life computers into useable spare parts with IBM. This study shows return obligations can be used as a cheap source for spare parts for systems on which one does not want to spend too much. The problems identified were a lack of knowledge of what actually was in the returned computers as well as an insufficient information system to handle the operations.

Driesch et al. (1998) described that planning and control of the actual processing of collected engines in the central recovery plant in Berlin, Germany. Among others it is mentioned that the disassembly, cleaning, test, remanufacturing and reassembly activities are dealt with lots, and then the number of engines that are disassembled is related to the number of reconditioned engines that are reassembled. Also here no further details are given, nor is explained how these lot sizes have been determined.

Thomas jr (1997) mentioned that the Pratt Whitney Aircraft remanufacturing facility in West Virginia uses MRP to schedule inspection and rebuild of military and commercial aircraft engines. The batch size is one because different engines have to go through different routing. Bottleneck is the engine reassembly. Buffer time is used to protect this activity form variations in foregoing activities. This time is determined via Linear Programming, but no formulas given.

Simons (2001) described that system setup by Trespa International B.V. this company produces sheets made from resins and wood fibers which are used in the building industry. The recycling system was setup to recycle or incinerate these sheets. Among others attention is paid to the collection of these sheets leftover from building
activities. These leftovers are put into containers supplied by Trespa. The customers let Trespa know when a container is filled. Filled containers are replaced by empty containers when new Trespa sheets are delivered to the customers. The reusable pallets used for the distribution of the Trespa sheets to the customers are collected by third party logistics service providers who get money for the pallets that they deliver to Trespa or by third party logistics service providers appointed by Trespa for the above collection. In the latter case, at least 15 pallets should be available at the moment of collection. Trespa promises its customers to collect these plates within 3 weeks. The party logistics service providers working for Trespa pickup the reusable pallets when they deliver new Trespa sheets.

Bakkers and Ploos van Amstel jr (2000) described that system setup by Ortes Lecluyse, a Dutch producer of PVC lamellas, for the recycling of these lamellas. Thereby also attention is paid to the sizes of the containers used for collection and the frequency for emptying these container located at their direct customers, being one once a week when new lamellas are delivered.

Landers et al. (2000) highlighted that importance of tracking components orders in the case of a closed-loop business telephone supply chin. The authors use a concept called “virtual warehousing” where real time information feeds expeditious algorithms to support decision. The uses of ICT lead to an improvement in stock levels, routing and picking processes when compared with the pre ICT scenario. Xerox uses bar code labels to track packaging material with the aim of achieving aim of resources preservation.
Ritchie et al. (2000) underlined that logistics does not stop with the delivery of goods to customers, but also offers the opportunity for stocks to be returned to suppliers via a feedback loop. He points out, for instance, the increasingly frequent occurrence that product recalls appear to have in the last years in private sector (as his article examine the Reverse Logistics process within the Manchester Royal Infirmary Pharmacy, in this pharmaceutical arena, the efficiency in withdrawing expeditiously the drugs from market, in case of need, result critical). His perspective drives the attention again on the suppliers as final destination of returned products and thus, endorsing the backwards direction of goods flows.

Fleischmann (2000) one of the authors of the confusion surrounding the concept and after considering four definitions from literature, concludes in the following characterization (p. 6): the process of planning, implementing and controlling the efficient, effective inbound flow and storage of secondary goods and related information opposite to the traditional supply chain direction for the purpose of recovering value or proper disposal. As he recognizes, municipal wasa collection is not accepted within the definition’s scope, as it does not concern flows opposite to the traditional supply chain direction. On the other hand “upstream flow” substitutes the producer destination of returned goods stated but some other perspectives.

Kivinen (2002) described that different service providers have different types of Reverse Logistics concept. For instance, some companies may speak only about the recycling of goods, which may actually include sophisticated features of Reverse Logistics. His piece of advice is therefore, between the parties involved, to define
clearly what reverse logistics will be understood in their relationship, as different persons will most probably have different views about reverse Logistics.

**De Brito and Dekker (2001)** described that Reverse Logistics is the process of planning, implementing and controlling backward flows of raw materials, in-process inventory, packaging and finished goods, from a manufacturing, distribution or use point, to a point of recovery or point of proper disposal.

**Van Hoek (1999)** underlined that do not mix up reverse with green logistics. The term green logistics is coined to refer to those practices within the supply chain that aim at reducing sources of waste and recourses of consumption. They are not specific of reverse logistics processes. For instance, disassembly is an operation needed within reverse logistics before deciding, in not few cases, what to do afterwards (repair, remanufacture or recycle it). However, only will it be linked to green logistics in the design process, if the disassembly operations are carefully thought for not going through destructive operations, which implied, at least a lot of added value if not also materials.

**Giuntini and Andel (1995)** provide with “R” one of this “R” stands for re-engineering (being the rest recognition, recovery, renewal and removal). Re-engineer the reverse stream implies, for these authors, to reduce (one more R) the amount of material, which will end up as waste. And, indeed one of the perhaps most powerful driver for the implementation of reverse logistics practices has been the problem generated from waste, waste is nowadays a big problem in many countries due to increasing volumes and the lack of landfills where to dispose of it.
Fernandez (2003) described that waste reduction is one of the aims behind reverse logistics practices (for instance, the ambitious German legislation regarding packaging has obliged manufactures to deploy techniques for dealing with their responsibility on the packaging recovery, reducing therefore its disposal). However, reverse logistics are not directly concerned with reducing the need for raw material although this reduction may be a side effect of adopting them.

Tibben (1999) highlighted that when one manufacturer purchases a retailer entire supply of a competitor goods. If a manufacturer from another channel buys from the retailer this kind of stocks, again the retailer could be seen as another middleman of the channel. Items from the selves of retailer’s facilities go to another destination (manufacturer in lieu of customer). Unlike the previous case, there is a movement which could be seen as backwards if the partners in chain are thought in the order manufacturer-distributor-retailer, but not within the same channel neither with materials or added-value recovery aims (plain competition driver). Something different happens when this manufacturer happens to be a recycler. The recycler needs the return of the product for get access to its constituent parts and materials. Recyclables may have their origin in household waste (final customers who discard products for one or another reason), retailers, distributors or the very original manufacture. The recycling was not the original destination for the product, which was aim at reaching the market where would be used by the final customers. In this case, there is indeed ad intention of recovering materials.

Ganeshan et al.’s (1999) highlighted those relevant matters on traditional supply chain management. In order to be engaged or to anticipate recovery activity, firms
have to consider several strategic, tactical and operational matters. At the strategic level, the design of the recovery network has to be decided upon first. At the tactical level, relationships with the partners have to be developed. Where measure to influence the behavior of partners are the relevant issue here at the operational level, inventories have to be managed and controlled, as well as the recovery activities themselves. As usual, information and communication technology plays an important supporting role.

**Louwers et al. (1995)** discussed the set up of a carpet recycling system. It concerns a special type of carpets, which can be recycled and its output used as feedstock in the chemical industry. Both the organization and the collection network are discussed.

**Sanders et al. (2000)** describe how the inventories of products are controlled within wehkamp, a Dutch mail order company, selling all kinds of consumer goods to the Dutch and Belgium market. Two types of products are distinguished products which are asked for during a very short period of time only, which are controlled by using an amended version of the newsboy model taking into account returns, and products that can be sold during a long period of time, which are controlled via a (R, S) policy with variable R and S.

**De Brito and Dekker (2001)** investigate the distribution of the return lag that is the time between the purchase and the return of an item for three cases, viz. a mail order company, a spare parts warehouse at a petrochemical plant and the warehouse at the center for nuclear research, CREN.

**Diaz and Fu (1997)** studied a two echelon repairable item inventory model with limited repair capacity. For several classes of arrival processes they develop analytic
expression for the number of items in queue at the different stages of the system. They analyze the impact of the capacity limitation and compare are applied the performance of their approach with an incapacitated METRIC type of model. Both models are applied to the case of spare parts management at the Caracas subway system.

Donker and Van der Ploeg (2001) described how that optimal stock of reparable service parts of telephone exchange is determined with in lucent Technologies Netherlands. They use an amended METRIC model, where the service measure is fill rate (that is the percentage of demand that can immediately fulfill from stock) and there is no budget restriction for service parts.

Driesch (1998) described that car engine recovery network setup by Mercedes-Benz for Europe, including the actual planning and control of the recovery activities in the plant in Berlin. Among others it is mentioned that the disassembly, cleaning, test, remanufacturing and reassembly activities are dealt with in lots, and that the number of engines that are disassembled is related to the number of reconditioned engines that are reassembled. Also here no further details are given, nor is explained how these lot sizes have been determined.

Quantitative Models: A lot of mathematical models have been developed that give insight into the results that might be obtained with certain planning and control concepts for product recovery. Many of these models actually deal with inventory management. They are as follows

With respect to collection, Du and hall (1997) give a mathematical model for determining the fleet size and the redistribution of empty equipment for the center-
terminal transportation networks. **Crainic et al. (1993)** present a mathematical model for the allocation of empty containers.

Regarding processing, Guide et al (1997a, b), and Guide and Srivastava (1998) present mathematical models for the planning and control of remanufacturing, distinguishing between disassembly, repair and reassembly activities. Spengler et al (1997), whereas Inderfurth et al (2013) present a stochastic model in case a used product can be reused in a number of different ways. Stuart and Lu (2000a, b) present an MIP model for determining the optimal processing level of a number of input materials all sharing the same processing facility.

A mathematical model to support the integral planning and control of collection, processing and distribution for reusable containers is given in Del Castillo and Cochran (1996) finally, Richter (1996, 1997, a, b) present deterministic models combining collection, processing and distribution as well as production.

**Ruta Aidis and Arnis Sauka (2005)** described that an issue gaining importance in transitional literature is the need to development capabilities through a thriving Small and Medium-sized Enterprise (SME) sector. However, it can be argued, that in order to successfully develop SMEs it is important to understand the specific barriers they encounter at different transition stages. Though there are a number of studies on SMEs in transition countries, no systematic analysis has been conducted on the effects of different types of barriers to SMEs at different stages of transition. In this paper they address this knowledge gap. They utilized indicators proposed in previous research to approximate three transitional stages to categories 23 transition countries into
transitional stages. On this basis, they develop a framework which identifies SME development in transition countries.

Rachida, Alberto and Julio (2005) highlighted a model-based approach. In this they re-examines the measurement of entrepreneurial activity at the national level. Their contribution centers on two main aspects. First, their study allows for the measurement of the likelihood of entrepreneurial behavior, or entrepreneurial propensity. Second, utilizing social network theory, they introduce the social entrepreneurial environment as a key indicator of likelihood of entrepreneurial activity.

Karita and Rodrigo (2005) described that SMEs strategic change in dynamic environments. In order to deeper understand these changes, the specific characteristics of SMEs strategic behavior, and the interaction of internal and external factors are included simultaneously in the analysis. The conceptual framework is based on studies of strategic adaptation and SMEs strategic behavior.

Mika Pasanen (2005) highlighted that study was to identify SME failure factor and trajectories. Moreover, three types of failure trajectories were identified: one failed borderline cases, second rapid collapse failures and three failed seekers of legitimacy. The results include that many factors associated with failure are internal, and so under the management’s control. One or few major factors seem to cause firm failure, though there are several inter-related factors and processes contributing to SME failure.
2.2 OBJECTIVES OF THE STUDY

- To identify the factors underlying reverse logistics capabilities, values and claiming back strategies.
- To develop a model of reverse logistics capabilities, values and claiming back strategies and evaluate the relationship which shown in the model.
- To test the model.
- To evaluate the mean difference of the firm running since from towards reverse logistics capabilities, value and claiming back strategies.
- To open new vista for further study.

![Proposed model showing the relationship between different variables that needs to be tested](image_url)

2.3 NULL HYPOTHESIS

**H01**: There is no significant cause and effect relationship between reverse logistics capabilities and value (cost savings).
H02: There is no significant cause and effect relationship between reverse logistics capabilities and claiming back strategies.

H03: There is no significant cause and effect relationship between claiming back strategies and value (cost savings).

H04: There is no significant mean difference of the firm running since from towards reverse logistics capabilities.

H05: There is no significant mean difference of the firm running since from towards value (cost savings).

H06: There is no significant mean difference of the firm running since from towards claiming back strategies.