



**A Study of finished goods inventory management of
FMCG products in the South Indian market after the
implementation of Goods and Service Taxation**

Subramanya Abiram Kathiresan

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Abstract

The primary purpose of this study is to investigate the method of inventory management that is followed in the fast-moving consumer goods in south India. The research is focused on south Indian states, which includes the state of Tamilnadu, Kerala, Karnataka, and Andhra Pradesh. India being a vast country and has a widespread market for Fast Moving Consumer Goods (FMCG) product selecting a particular region helped in carrying the research effectively. A qualitative methodology was chosen as the method for analyzing the data. The primary data collected from the participants through interviews were content analyzed and the conclusion was drawn. The participants for this study were particularly chosen from warehouse management and inventory controllers who have gained experience to answer the questions. Secondary research was conducted on journals, reports, newspaper, and articles. Both primary and secondary data were in line with each other supporting and complementing each other.

The study revealed that inventory management of FMCG products differ from one organization to others, but a majority of organization use floating stock to be their stand-alone inventory model. While other companies follow a hybrid model of using floating stock along with the base stock, first in – first out (FIFO) and cross-docking. The major challenge in distribution remains to be the flow of information within the distribution network. Inferred from the ground study, the implementation and the working model of enterprise resource planning (ERP) is found to be in the infant stage for the FMCG sector of south India. In the long run, for Indian FMCG flow of information needs to be streamlined to increase the efficiency. Goods and Service Tax (GST) in India has helped a lot in re-engineering the distribution network and in centralizing the warehouse that is witnessed qualitatively in the study. Business is all about the return of investment (ROI). Post GST the efficiency and the performance of the business has increased increasing the ROI. The primary and secondary data concludes the same. Along with findings, some recommendation is made for the FMCG sector for future improvements.

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Terms, Abbreviations, and Definitions

The following terms, abbreviations, and definitions are used in this document:

Table 1 Terms, Abbreviations, and Definitions

Term	Description
GST	Goods and Service Tax.
FMCG	Fast-Moving Consumer Goods
FG	Finished Goods
CENVAT	Central Value added tax
VAT	Value-added tax
JIT	Just in Time
TQM	Total Quality Management
LSCM	Lean Supply chain Management
ERP	Enterprise Resource Planning
ICT	Information and communication technology
MPS	Master Production System
RFID	Radio Frequency Identification
B2B	Business to Business.
SCM	Supply Chain Management
CW	Central Warehouse
RW	Regional Warehouse
SC	Supply Chain
FIFO	First-in and First-out
SKU	Stock Keeping Unit.
ROI	Return of Investment
3PL	Third-Party Logistics
IoT	Internet of things
KPI	Key performance indicator

The topic of Research: A study of finished goods inventory management of Fast-Moving consumer goods (FMCG) in the south Indian market after the implementation of GST.

Chapter 1: Introduction:

1.1 Background of the study:

Fast-moving consumer goods (FMCG) are products that are sold in a very short span of time at low-cost and are high in-demand. These products have a high consumption rate with consumers. FMCG covers beverages, food products, household products, cosmetics (oral care, skincare, and haircare), toiletries, dairy products, bakery products, tobacco products, and natural products. FMCG is the 4th largest sector that contributes to the GDP of India, growing from 57.75 billion US\$ in 2017-18 to 103.7 billion US\$ by 2020 (IBEF, 2019).

These products have a high volume of movement of goods in the market as they are frequently purchased by consumers. To facilitate the purchase of these products a well-designed downstream supply chain network is needed in the growing Indian market. Structured supply chain reduces operation cost, improves customer accessibility, and increase the return of investment (ROI).

Supply chain logistics has a vital role in managing the supply and demand for providing efficient and effective delivery. Possessing the entire synergy of goods movement, supply chain logistics has become the fundamental focus of any business. The key objectives of a growing business are optimizing and re-engineering inventory management for effective maintenance of local inventories to reduce the delivery times (Emerson, 2009). The empirical needs of optimizing the finished goods inventory add value to the business providing a competitive advantage.

Taxation has a significant influence on the movement of goods and the method in which it is moved (Shunko, Do and Tsay, 2017). Tax becomes the

single large overhead cost of the firm. The position of the warehouse influences the taxation structure to a greater to extend (Shunko, Do and Tsay, 2017). Goods and Service Tax (GST) was implemented in India on 1st July 2017 defining a new taxation structure to the nation making the country unified, into a single market from cascading taxation to dual taxes (state GST and central GST). GST provides an essential opportunity to consolidate the warehouse and more possible ways to increase the efficiency of the downstream supply chain.

The downstream supply chain starts with warehouse inventories. Inventories represent the holding cost of the company and have a major impact on the financial performance of a firm (Cannon,2008). Companies try to re-invent their downstream supply chain based on the taxation and geographical proximity to their market (Tompkins, 2013). The competitive advantage of companies is decided by their inventory management schemes and the proximity of their warehouses.

The prevailing structure of the downstream supply chain in the Indian market is complex and does not hold a convenient inventory management system for the post GST era. Various literature studied shows that the efficiency of inventory management needs to be improved for the living business world. This study drives to qualitatively analyze the suitable inventory management methods and optimize the multiple location discrepancies in warehouse distribution. This would eventually increase the efficiency of the FMCG supply chain in south India as they remain hard for the organization to understand (Gomathi and Gomathi, 2013; Kumar and Joseph, 2014).

1.2 Research Aim and Objective:

The efficiency of the supply chain is directly linked to finished goods inventory management and their distribution methods. The aim of this study is to find plausible inventory management of finished goods in the Fast-Moving Consumer Goods (FMCG) sector of the south Indian market after the implementation of GST.

The core objectives are as follows:

1. To find the methods of effective inventory management.
2. Problems that are being faced with the current ERP system in the south Indian FMCG.
3. To analyse the geographical impacts on justifying the warehouse centralization.

Chapter 2: Review of Literature.

2.1. Supply chain management.

Forrester (1958) pioneered the theory of distribution management, that discussed how a company's success depends on the inter-activity between the flow of information, material flow, overhead cost, money, and use of manpower. The competitive advantage of the company in the business world relies upon efficient handling of all these five elements which are interlocked to each other in nature. Over the 40 years of identifying such management techniques. The supply chain has gained a prominent part in the company deciding the performance of the business. Despite many ambiguities in understanding what supply chain management (SCM) is? Cooper, Martha, and Ellram (1993) and Tyndall et al. (1998) synthesized SCM as an Inter-connected system between vertical integration and separate identities as one part and as a management practice in other. Readers often get confused with "Logistics" and "Supply chain management". There is a fine line that is used to find the difference between them.

Logistics is the part of the supply chain process that plans, controls and implements the effective and efficient flow as well as the storage of goods or services from the point of origination to the point of consumption in order to meet the customer's demand (Mentzer et al, 2001). But supply chain management is defined as systematic and strategic coordination of the business activities and tactics across the other business activities of one particular company and across the business activities within the supply chain for the purpose of increasing the efficiency in long term to have a competitive advantage in that business and of supply chain as whole (Mentzer et al,

2001). To measure the efficiency of the company – “Industrial clock speed” was Introduced in 1996. Mendelson and Pillai (1999) argued that there is a greater need for perceptive focus in the flow of data in the organization to achieve the targeted industrial clock speed. Followed by the growth of the internet in the late 90’s material requirement planning - 1 and material resource planning -2 were constructed into a common form as ERP (Rashid, Hossain and Patrick, 2002).

ERP system is able to collect all data in live related to any activity carried in the organization into one seamless flow of information, providing transparency and live updates across the entire supply chain mitigating the data distortion. This facilitating adaptability of ERP in the supply chain has made it a mandatory component to operate a business (Akkermans, Borgerd, Yucesan, and Van Wassenhove, 2003). The success of the contemporary business is built on the effectiveness and the efficiency of the supply chain, customers have the option to pick an alternative. The key strategy of the current business lines in inventory management, reduction of lead time, addressing customer need (reaching more customers) and ensuring Return of Investment (ROI) (Stadler and Kilger, 2002).

2.2. Goods and Service taxation.

Indirect taxes such as VAT and GST are inextricably linked to the supply chain activities. Goods and Service Tax (GST) influence the activities of a supply chain from sourcing of raw material, movement of finished goods, distribution and retailing. Companies anticipate ways to effectively manage taxes, incentives, and grants for growth of the organization.

Of all the expenses of the firm, the tax becomes the single large expense. In India, the Goods and Service Tax (GST) was implemented on 1st July 2017 bringing unified taxation replacing the cascading structure (CENVAT and VAT), where no credits were paid to the manufacturer. Cascading taxation structure (tax on tax) increases the tax levied as the length of the distribution leg increases (Nayyar and Singh, 2018). Post GST after unifying tax, trade border between the states are neutralized. It has become imperative to

calibrate the downstream supply chain for improving efficiency and to reduce multiple taxations on goods (Roy, 2017). The efficiency of the downstream supply chain can be improved by appropriate inventory management and optimizing the logistics.

2.3. Inventory management of finished goods.

2.3.1 Need for inventory management.

Finished goods inventories are the current assets in the statement of financial position of any firm. Post GST the warehouse can be consolidated as there is no longer a need for a warehouse in respective states (Sharma and Gupta, 2017). The input tax credit is applicable only when products leave the warehouse. As a result, maintaining and managing optimal inventory becomes more crucial.

The prime manufacturing philosophies JIT (Just in Time) and TQM (Total Quality Management) considers abnormal inventories as inherent waste and helps in optimal maintenance (Flynn, Sakakibara and Schroeder, 1995). Ehrhardt (1998) argues that demand for the finished goods are subjected to fluctuation but Just in Time system consider them to be static. Failing this understanding, JIT may often result in stock-outs.

Lean supply chain management (LSCM) helps in formulating the finished goods inventory by observing the oscillations from the demand end (Negrão et al, 2017). Such alignment is brought by cost and waste reduction, process standardization, and adaptation to industrial standards. Marodin et.al, (2017) proves that the efficiency of an inventory handling increases with LSCM by Lean shop floor practices is achieved. One size doesn't fit all - companies customize their LSCM practices according to the way they do business. After analyzing 30 frameworks of LSCM which are suitable for India, Jasti and Kurra (2017) conclude that Indian manufacturers are struggling with challenges in cost of inventory, demand management and process standardization as their market is very diverse.

Inventory management has two dimension - Time interval and Order point (Chikan, 1990) while JIT and LSCM are based on time. In order to analyze the order point, researchers developed many simulation software. According to Bertolini and Rizzi (2002), a comprehensive master production system (MPS) can effectively optimize the inventory from the order point.

2.3.2 Types of Inventory handling methods in FMCG – Indian FMCG:

India remains to be a potential market for the Fast-Moving Consumer Goods (FMCG) due to its high population. These goods have high volume and cycles of sales with the customers. Consumption of consumer goods has grown to 57.75 billion US\$ in 2017-18 from 31.6 billion US\$ in 2011 and is expected to grow to 103.7 billion US\$ by 2020 (IBEF, 2019). The market is segmented into three segments as follows:

- Food and beverages account for 19%,
- Health care for 31%,
- Household and personal care for 50%,

Accommodating 55% of urban market share and 45% of the rural market (IBEF, 2019). On comparison of the north Indian markets to south Indian FMCG's, the marketplace on the north has local producers as well the organised companies with smooth goods movement. But in order to penetrate the south Indian market, companies preferably go with the Mergers & Acquisition strategy (Narasimhan, 2016)

However, the market is hard to penetrate, south Indian FMCG market has the 'higher per capita consumption', says Kurush Gant, Executive director, FMCG business, ITC (Singh, 2014).

Consumer package goods or FMCG has the maximum number of sales in a given period of time. There exist various methods to manage their inventory. RFID (Radio-frequency identification) is state-of-art technologies that enhance the visibility of downstream supply (Michael and Mccathie, 2005). For their ability to reduce the bullwhip effect (the phenomenon of increase in

the amplification of demand from retail end to the distributor end), maintaining buffer levels of inventory can be considered as a form of extended Lean management (Powell and Skjelstad, 2012). Musa and Dabo (2016) conducted an extensive literature study of RFID from 2000 -2015 suggest that the performance and implementation of RFID in inventory management of FMCG are increasing.

Dekker et al., (2009), advocates “floating stock management” (intermodal connections) model are effective inventory handling methods where intermodal transportation can provide proximity to the demand point. The article provides a case study of a Polish FMCG inventory handling method. Singh and Misra (2018) studied the effectiveness of the theory of constraints (TOC) in Indian FMCG and found that the result obtained is not consistent in the long run. Tanksale and Jha (2017) analyses the multi-facility inventory of two food crops in the Indian public distribution sector (government-owned retail for non-profit), where the storage location is limited but spread across the countries. This provides knowledge that each inventory system needs to be customized according to the order points. In beverage industries, the finished goods inventory is controlled by scanning the bar code (Rai and Singh, 2012). Working forward, Singh and Acharya (2014) state that the out-bound supply chain needs to be more flexible in adapting new ways to meet the fluctuating demand.

Apart from the holistic view, drilling deep down to FMCG of India. Inventory management practices are very discrete. This is due to the lack of opportunities to predict demand. Post GST, one central inventory system can handle vast area as demand across states can be supplied without tax. In the pre-GST era, taxation structure was a screen for interstate operations.

2.3.3 External demand and market size:

Effective inventory management is key skills that business today needs to master to increase the performance and efficiency of SC. Such parameter (inventory control) is influenced by various factors size of the firm,

profitability, safety stock, speculated stock, pipe-line or in-transit stock and distribution behavior. Where all these are internal factors. The major external factors are customer behavior, external demand, market size and brand analysis (Stadtler and Kilger, 2002). Stockout is external factors that affect the performance of the business, which is caused by paying low attention towards external demand and market size (Chan et al., 2017). Market size and external demand are equal and competitive forces in deciding the inventory holding in the warehouse. Olsen and Parker (2008) investigate the inventory model and bring clarity on these parameters. According to that, markets are classified into 'committed market' and 'latent market'. The committed market is market where the cycles of sale are maximum while the latent is a market where the probability of sale is minimum compared to that of the former. Cachon and Zipkin (1999) with a verified result advocates that, the inventory holdings depend on the market with the warehouse supply to, the market can be committed market (External demand) or a latent market (market size). This depends on the organizational marketing mix and competing with another competitor.

2.4. Enterprise resource planning.

ERP is an advanced integrated manufacturing and distribution system (a form of MPS), the working model of ERP is based on the sharing of information between the various operations of the supply chain. A product request from the distribution end is converted into a production order made to a finished good (Kelle and Akbulut, 2005). Ehie and Madsen (2005) state that ERP's are not the stand-alone application which requires a seamless flow of information chain which requires an effective project management team. Mishra and Mishra (2010) studied the post-implementation of ERP in an FMCG organization in south Asia - the article suggests that the integration of a market and factory is obtained by using ERP system in both dimensions – Time and order. In India, the logistics of FMCG has evolved the same way as a global supply chain with the use of ICT (Information and Communication

Technology) and upgradation in the ERP systems. Srivastava (2006) states through the degree of usage of ERP systems is considered to be an average across India, the visibility of it is limited only to particular firms. The study on ERP and ICT enable downstream supply chain in the southern states of India, particularly Tamilnadu by Poranki, Perwaj, and Akhtar (2015) shows that the activities of distribution are handled manually rather using ERP. As a result, an organization should have an efficient inventory management system to cover the risk of stock-outs of FMCG products in a growing economy. This could be achieved using ICT and ERP systems.

The wide success models of the supply chain are facing failures in the southern part of the Indian FMCG sector which brings a necessity to study the finished goods inventory management in those regions.

2.5. Location of the warehouse.

2.5.1 Structure of downstream supply chain:

GST has given an opportunity to consolidate the warehouses. The decision for locating the warehouse become a strategic, tactical and operational challenge for supply chain executives.

Devangan (2016) states that the warehouse becomes the converging point to all products from the different production site. Location of the warehouse has to designed in such a way that it should absorb the inventory from the production site and distribute them to the potential market.

Inventory's location determines the competitive advantage of the business. Diabat, Battaïa, and Nazzal (2015) developed an algorithm to eliminate the feasible solution that is not applicable to the joint location of inventory in the downstream supply chain. Considering the same parameters, Diabat and Theodorou (2015) proposed a model for the optimal number for distribution centers (warehouses) needs to cover multiple retailers. Although these are mathematical derivations, they derived tabulation of data which serves as a guide in optimizing the structure of the supply chain (Farahani, Steadieseifi, and Asgari, 2010). Singh and Ahuja (2017) recommend that the hub and

spoke model of Inventory's location that can be the new phase of distribution pattern in India. Despite all distribution planning and inventory planning. Kumar and Joseph (2014) state that the buying behavior of FMCG in south India is affected by stock-outs.

2.5.2 Geographical location of the warehouse:

To meet the demand of the products or service in one particular place or market, location becomes a critical component. Inventory management, information technology, use of ICT based tools, internet of things (IoT), improved forecasting services are very significant tools of SCM to move products to the vendor. The real question is from where? - Deciding the location of the warehouse. Analyzing the geographical location of the distribution hub were a primary task of business even before the management philosophy of supply chain existed.

Simpson (1958) constructed a mechanism of holding optimal inventory in every node (geographical location) of the distribution network known as the 'base stock system' where replenishment is posted to the previous point in the network. In the Simpson model, the replenishment is based on external demand. During the same period, Hanssmann (1959) developed a model of holding inventory level at different nodes (geographical location) in the distribution network to encounter the mean and variance cause in stock management and in reaching the market. Hausmann model is based on replenishing order depends only on the inventory levels maintained at the nodes. Simpson model and Hausmann model are in complete contrast to each other. But they are more convergent towards one idea of holding a strategic warehouse location in the supply network. The challenges in modelling a downstream supply chain are to bring an exact balance between distribution network, cost of distribution, inventory to handle the retails without stock-outs are major. Shen et al. (2003) investigates the risk pooling model and developed a new model to integrate the location and inventory.

In the FMCG industry, designing and deciding the location and the distribution network involves analysing all four major supply chain performance drivers: Inventory, facility, transportation, and information flow.

Ashrafzadeh, Rafiei, and Zare (2012) developed an analytical method to critically analyze the criteria for selecting the location. Feldman, Lehrer, and ray (1966) addressed the same decision making from another dimension of “Economies of scale” bring a relationship between the number of warehouses to the shipping cost which affects the overall cost.

Ozsen et al, (2009) prove the multisource capacitated location-inventory model with risk pooling (MCLMRP) in a retail supply chain using a mathematical derivation. Having multiple warehouses in the same location can reduce the cost of transportation and decrease the lead time associated with the delivery. On the other hand, Kellner, F., Otto, A and Busch., A., (2003) argues that centralizing the warehouse for one particular region can be only done after understanding the overall transportation cost, fuel cost, toll cost and most precisely the shipment size. The decision regarding de-centralizing and centralizing of a regional warehouse has several sets of analysis of all the above-mentioned parameters. But the GST in India has given an opportunity to choose and decide the best practice of supply chain in terms of deciding the warehouse (Deloitte, 2017).

Chapter 3: Research Methodology

This chapter explains the components of research that are required to understand and analyse the study. In order to addresses, the objective of the study collects primary data supporting it with secondary data, method of analysis and synthesizing the result. This particular chapter explains the researcher to understand and formulate the path of study in fixing the philosophy, design, approach methods of data collection, sample size, target population, limitations, analysis, and ethics.

3.1 Research Philosophy:

In research, philosophy forms the bedrock for the fundamental assumption to help the researcher in collecting data, interpreting data and in concluding the result (Creswell, 2013). Choosing a philosophy for the research sets the

course for conducting the research. The philosophy that researcher adopts has a significant influence on the approach and view on how the research is conducted. These philosophies are broadly classified into interpretivism, positivism, pragmatism, and realism. Each of these theories has a finite set of principles and approaches bonded to it defining the method of research need to be conducted while choosing them (Saunders, M., Lewis, p. and Thornhill, A.,2009)

Of all these approaches, the researcher will use interpretivism over positivism approach to understanding the problem, to frame questions, collect data and analyze them. Interpretivism approach makes the researcher enter the research world, precisely the field of inventory management and understand them in their point of view to carry out the study. Inventory management of FMCG in India has more nuances that need to be analyzed in order to observe the working model of it. Particularly, the southern part of India is a potential market of varying market sizes and the level of complexity increases in this zone of India. Carefully considering all these, interpretivism philosophy guides in shaping the questionnaire and in carrying the research further.

3.2 Research approach:

The Research approach defines the way of data collection, analyzing them and in building or verifying the theory. The Taxation structure has brought a major change in the nature of designing the inventory of FMCG products and in re-structuring, the supply chain, understanding the handling methods helps business in attaining competitive advantage. Inductive, deductive and abductive (a combination of inductive and abductive) are the major research approaches (Saunders, M., Lewis, p. and Thornhill, A.,2009). The Inductive approach of the research aligns with the interpretivism philosophy (Creswell, 2013). The hill climb approach starts with a question, analyze the problem and comes out with theory. The inductive approach provides a systematic set of procedure for analyzing the qualitative data and provides results that are reliable in nature (Thomas, 2006). Therefore, the researcher would prefer to

conduct inductive research. This, in turn, provides a clear primary and secondary data collection to formulate the new observation of the supply chain realm.

The fast-moving consumer goods division of India is vast and would be complex to address the whole region. The researcher has considered the southern part of India which includes the four states Tamilnadu, Kerala, Karnataka, Andhra Pradesh, and Telangana where selecting the participants are viable and feasible for the researcher.

3.3 Research Methodology and Design:

Methodology dictates the pathway for deciding the method in which the research is conducted. Three different types of research – Qualitative, Quantitative and mixed research methods – a combination of qualitative and quantitative (Saunders, 2016).

Qualitative methods involve the collection of data through interviews, group discussion where the interview can be face to face and non-face to face. In this research, the main methods of data collection are through primary interviews, focus group and questionnaire. The secondary data is collected from books, journal articles, business magazines, reports and websites (Saunders, 2016). This sector consists of many products and variances in them which are targeted towards various customers. The participants are selected from a different region of south India which will provide an unbiased and clear study for the research. All three key objectives – Inventory, Location, and ERP can be studied by conducting a qualitative analysis with the supply chain executives as these professionals are well aware of the target population, interstate taxation and the overall taxation levied on the goods during transport and transfer.

3.4 Methods of collection of data:

The researcher has carried out both primary and secondary data collection in the process of data collection. The participants of the primary data collection are carefully decided as the research study depends on them (Graue,2015). The participants of these primary data collections are from the following disciplines. Warehouse manager, regional distribution managers, logistics executives and SCM managers of FMCG sector who are experienced in operations. The primary data collection involved direct interview through telephones, focus group and discussion with a questionnaire, data were carefully recorded for analysis. Non-probability sampling is done to select the participants (Saunders, 2016). A pilot study is conducted to test the questions for the interview (Saunders, 2016). The sampling for the pilot study is selected conveniently. The interview was conducted with a sample space of 18 participants who are expertise in inventory handling and user of ERP in any kind. The secondary data collection is from books, journal articles, case studies, journal articles, newspaper, and published market research. Apart from mathematical and quantitative analysis, qualitative methods remain to result fully in studying the inventory's location management. Hernandez and Biasiotto (2001) conducted a survey to understand the strategic position of a retail store in Canada after the increased flow of retail players from the United States of America. The location decision making involves qualitative assessment and high interpretation of the retail landscape. The key piece of information from this study, 8% from total sample conveyed 'Experience' obtained in the field was a key technique in deciding the location.

The aforementioned studies of Dekker et al., (2009), Srivastava (2006), Negrão et al., (2017), Marodin et.al, (2017), Jasti and Kurra, (2017), Singh and Ahuja (2017) and Kumar and Joseph (2014) are qualitative approach of understanding the supply chain, working towards the efficiency of them.

3.4.1 Interview questions:

In order to address the objective of the study, each component linked to the efficiency of the inventory management need to question. A total of 19

questions were asked to the participants, methods of inventory management, drawbacks of the current ERP system and factors that influence in centralizing the warehouse.

Inventory management:

- Has GST helped in effective FG inventory management or stepped back to primitive methods?
- What factors influences the inventory holdings more – Market size or external demand.
- What is your model of FG inventory management?
- What is your distribution network model?
- Does tax slab influence your stock handling - Products that are taxed between 5%, 5%-12%, 12%-18% and above 18%-25%?
- How do you plan your inventory - short-haul distribution and long-haul distribution?
- What is counted as your on-hand stock?
- Have you increased or decreased your buffer in maintained safety stock?
- What kinds of risk did you encounter in organizing the inventory after GST?

Enterprise resource planning:

- Do you have an ERP system to monitor the finished goods inventories?
- What live update an ERP user is missing in the current communication chain?
- Where do you find the ERP is fragmented in terms of data collection?
- Are you able to view and use data of all SKU's in the warehouse?
- How often do you make a manual entry in a day?
- Is your ERP system capable enough to record stock transfers?

Geographical location and business performance:

- How do you decide the geographical location of the warehouse by market size or distribution pattern?
- If the location is fixed, do you centralize your warehouse or will decentralize further?
- Are you able to satisfy or reach more customers after GST?

- What has happened to your lead Time – Increased or decreased?

3.4.2. Sample size and methods:

The sample population and size are the key parameters to be considered in a qualitative research method. The researcher considers probability sampling over the non-probability sampling, the participants need to be chosen from the particular profession of inventory managers (Higginbottom,2004). The participants are chose selected through random sampling, where there is a probability of them getting chosen had an equal chance from the targeted population.

The sample size of the was carefully arrived so, that the participants are chosen from the entire sample size for the research. The network of FMCG is complex and spread over entire India. The researcher has taken the southern Indian states as the zone of study for this research. The participants are experienced form 3years to a maximum of 15 years in inventory management and in logistics employed as executive, junior officer, associate warehouse manager, warehouse manager, warehouse manager, regional distribution managers, and Logistics executives. These organizational positions of the participants are best suited for the data collection as they are prime professionals to be questioned for evaluating the scenario. The core aim of understanding of finished goods inventory management after Goods and service taxation can be cleared drafted only by collecting data from them.

3.5 Data Analysis Method:

Data analysis form an integral part of the qualitative research, the data collected during the process of primary data collection is carefully interpreted by various analysis methods some are theoretical propositions, Triangulation, Grounded theory and content analysis (Graue, 2015). All these about mentioned methods of data analysis has its own advantages, disadvantages and its application. Of all the methods the researcher used a content analysis method to understand the nuances of the interview to fulfill the aim and objective of the study. The content analysis tool was helpful to dive deep in understanding the data collected during the interviews.

3.6 Research Ethics:

This research is conducted under strict and excellent ethical guidelines from the National College of Ireland. Stern ethical practices were employed in the primary and secondary data collection. Privacy of data, plagiarism, and copyright were scrupulously considered. Only the participants who were willing to take the interview and answer the question were selected according to the sample size. Identity of the participants was not exposed in any part of this submission and was given full freedom to deny or withdraw the interview at any point of the time (Saunders, Lewis, and Thornhill, 2009). The finding of this study is available to the participants after grading. In-text citations are providing credit to contribution done by other researchers. Telephonic interview and online forms were used because it would be complex to schedule appointments for direct interview. The conversations between the researcher and participants in the telephonic interviews were not recorded for privacy purposes.

3.7 Pilot study:

Fundamentally the study is based on inventory management and supply chain, concentrating on one particular sector of "Fast-Moving Consumer Goods". A pilot questionnaire was prepared, and the feedback was gathered. The final questionnaire was consolidated according to the feedback from the experts who work in inventory management and former students of supply chain management. Followed by scheduling the interview with the participants. The pilot study helps in drafting the questions that draw direct answer towards the objective of study reducing the interview time and discussing the key aspects.

3.8 Research Limitation:

The method of qualitative research has its own limitation the nature of the interpretation is affected by the characteristics of the researcher (Bryman and Bell, 2015). This study of finished goods inventory management of FMCG products is limited only to the southern part (Tamilnadu, Kerala, Karnataka, Andhra Pradesh, and Telangana) of India with respect to the financial budgeted as on July 2019.

Chapter 4: Data analysis and findings.

The chapter brings the detailed analysis of the overall collected data from primary and secondary sources. Also providing a complete analysis from the primary data provided by the participants of the interview. Suitable graphs and numerical representations are used by the researcher to provide a crystal-clear understanding of the study.

4.1 Process of data analysis:

The responses collected from the participants are studied, interpreted and worked to find patterns from their answers. The participants are from the same sector who handles different products. The key information regarding inventory handling, issues with ERP are synthesized to identify a clear pattern. The interpretations are structured into 4 different sections as finished goods inventory management, distribution pattern and network, issues faced by ERP user in the FMCG sector, the geographical location of the warehouse and lead time management.

4.2 Content analysis of the responses from the interview.

For this research 18 participants were chosen from different companies of the same sector to address the primary question of the study. The analysis of the interview question and the answer collected are as follows.

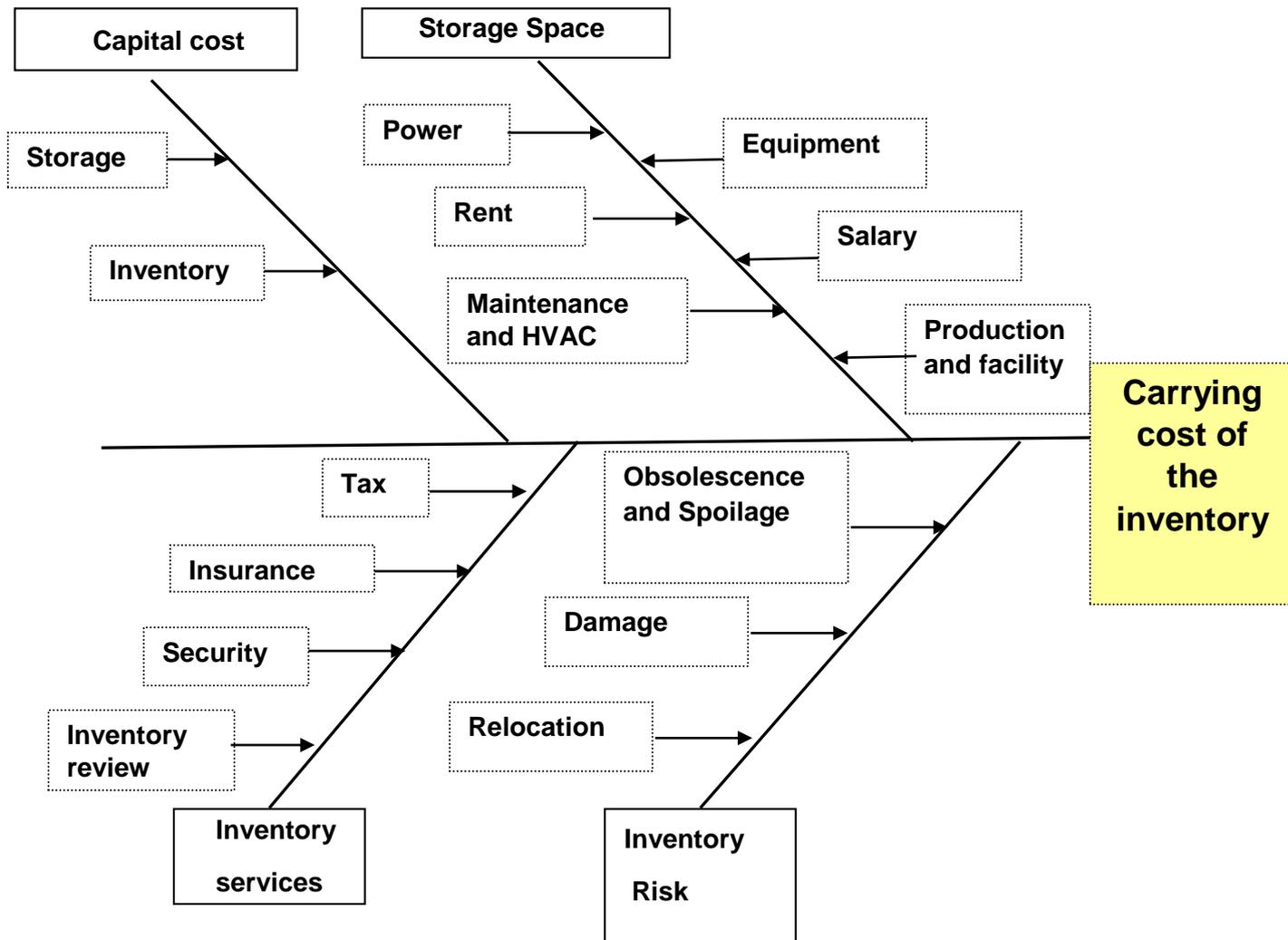
4.2.1 Finished goods inventory management if FMCG in south India.

The effectuation of Goods and Service Taxation (GST) has transformed the downstream supply chain to effectively plan and deliver products across states (Tamilnadu, Kerala, Karnataka and Andhra Pradesh). Not just the distribution network, the way of inventory handling has transformed across the FMCG sector of south India.

Inventory at any stage (raw material, work in progress and spare parts) are holding investments that are irreversible. Finished goods inventory is

investment along with the cost of production added to it. The overall carrying cost of inventory is shown below.

Figure: 1 Carrying Cost of Inventory.



The design of the downstream supply chain depends on – the amount of inventory held, the model of inventory management, the network pattern of distribution all these are influenced by two primary factors external demand (committed market) and market size (latent market)

The prime focus of FMCG business lies in responding to the external demand where the cycles of sale are maximum (committed market). Inferred from the interview 77% of participants agreed that, they respond only to the external demand. Gupta and Maranas (2003) also insist that the function of the warehouse at close proximity is to immediately handle the stock-outs situations and ensuring demand fulfillment. While the rest of 23% tend to show their focus on market size. The main reason to focus on external

demand is, in India 70% of the total sale is done to the middle-class households. Of that, over 50% of the sale is made in rural parts of India (Raj and Selvaraj, 2007). Usual and regular selling products are directed towards the rural market. While initial launching products, premium products, products that are targeted towards special customers - like adult diapers are directed towards the urban market.

The inventory model places a major role in meeting demands and ensuring replenishment. The FMCG sector of south India is growing and at the same time, it is widely dispersed. To be in pace with the market, the warehouse management system should keep the stock flowing in any given point of time.

In addressing the prime objective of this study, 'Floating stock inventory management' remains to be a successful and efficient method to handle FMCG products in the south Indian market. Many practices involve using a combined (dual) model of inventory management depending on the nature of the product. Inferred from the primary data, 50% of the participants (9 participants) practice floating stock model as their stand-alone model to handle stock within the warehouse after GST. The graph below shows the different inventory model practiced by the companies.

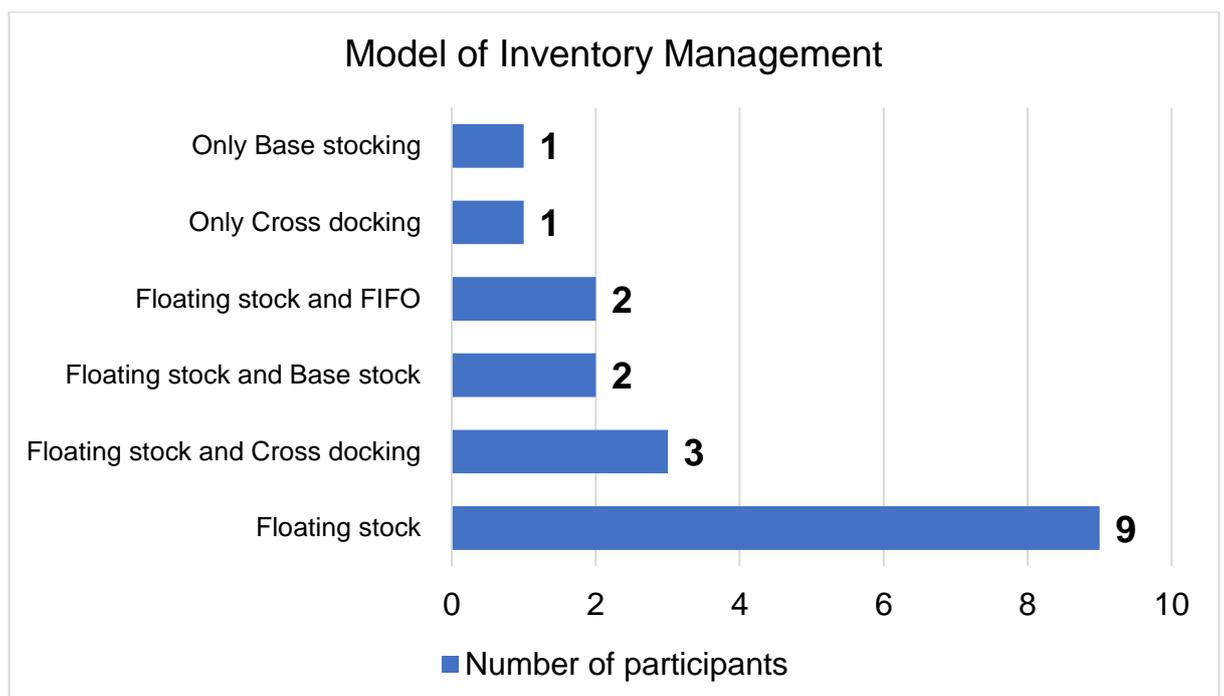


Figure 2: Inventory management followed in south Indian FMCG.

Ochtman et al., (2004) and Dekker et al., (2009) stated that for a dynamic and swift changing market such as India particularly dealing with Fast-moving consumer goods, keeping the stock in a floating state would help in the reduction of lead time while operating with a minimum optimal inventory. As the nature of the product (shelf life) differs, companies use a dual model (hybrid) to handle stock. Such as – floating and FIFO, floating and cross-docking and floating and base stock. Evidently, 7/18 companies have moved towards using a dual method of inventory handling while the remaining 9/18 companies practice floating stock.

In floating stock, the stocks are short lived in the warehouse. They are either moved to another location or to merchandising, which means the stock are pushed into the pipeline (inventory is mobile) saving more space in the stockroom of warehouse. This key attribute of floating stock has made it more applicable in practice.

4.2.2 Distribution pattern and network:

The distribution network remains to be the bloodline of SCM. Overall, the pattern of Fast-Moving Consumer Goods (FMCG) distribution has witnessed some changes in south India after GST. Around 80% the network has evolved into multiple layers of a hub and spoke model. In this manufacturer does the distribution only to the first and second-tier warehouse, from there the third-party logistics (3PL) deliver goods to the rural and hill regions. Adapting to the hub and spoke model has cut down the length of the distribution leg. The remaining 20% of the manufactures take control of the network and does direct distribution or a web network depending on the product.

Chhabra and Farooque (2018) state that companies adapt to a different form of distribution design or method depending on their target customer. These decisions are made in order to achieve a perfect marketing mix. In a discussion with the general manager of the supply chain- CWH added that “Profit is made in the market, we are facilitating and ensuring the availability

of the product in place. Upon request from the marketing team, we are flexible enough to change the distribution pattern – from supply to stockist to a salesperson who goes door to door”.

On-Hand Inventory: Recent change over in the inventory management and distribution pattern has affected the on-hand stock to a maximum extent. In south India, about 77% of the warehouses have increased the buffer limits post-GST. The ability of distribution reach and the change in the distribution system brought a need in increasing the buffers. Apart from the buffer, the on-hand stock is cumulative of buffer stock, safe stock and the amount of floating stock in the warehouse. Nowadays, as cross-docking has streamlined the flow of products and the product does not wait in a particular WH.

Pipeline stocks are also considered as inventory only till the warehouse and first-tier stockist. When it moved from the first-tier stockist it is considered as a sold product not anymore as stock. A manager from the WH confirms this, “We are following cross-docking to address the need at the first place, we fell the market pull force has increased. Recently, we are witnessing more sales, to ensure on-time delivery the buffer stock has been increased”. Moncayo-Martínez et al, (2016) advocate that the inventory on hand should and always dependent on the rate of demand in the addressing market and should have the shortest route to reach them. Holding more inventories under such situation would cost the business.

4.2.3 Issues faced by ERP user in FMCG sector:

The use of an ERP system in the FMCG of south India is still in the infant stage. There are many gaps and fragmentation that are needed to be addressed in order to improve the information flow within the organization. While interviewing the dock manager of supply chain discuss that “Made to orders is our priority in distribution, the details about them are not updated. The part number of the product changes with the change in the expiry date, ERP system that we use does not update them. Manual entries are made in

such a situation to update these critical data. Due to which we have failed many times in fulfilling the order”. Upon analysis, around 61% of the ERP user (of any kind) are facing this particular problem in regard to the updating and inflow of information.

Added to this, an organization that has implemented ERP are not able to collect, record, streamline and communicate the primary data that are needed for the supply chain. There are many gaps that can be identified after interviewing the professional. Some are – incidents in which there is duplication in the production order (dispatched order still remain in the system as fresh), mismatch between physical and system stock, the record related to loss or damage of the product, data required to consolidate during audits and traceability of the products are some common issues that are encountered in an average day. The manager- warehouse operations say “consider a scenario of dispatching 2500 quantity of same product, while cross-docking we only have ordered for 2300 the rest is retained in the warehouse. The system does have an option to make a note of this remaining 200 quantity. In such a case, we create a new production order and retain the material in the warehouse “. On the other hand, 55% of the total participants are not able to view or use data of the SKUs that are operated through their distribution line. These both are an extreme scenario in which the former has no option to record data, the later is not able to view the recorded data.

The Fast-Moving Consumer Goods segment of South India is unorganized in terms of collection of data and in report generation. Even today SC managers, warehouse managers, and inventory controllers make manual entries to keep the record of the data.

On an any given day, a user of ERP makes between a minimum of 3 to a maximum of 30 manual entries. Even some companies do not have any form of ERP for monitoring their supply chain network. Instead, they use a spreadsheet to keep the record of the data.

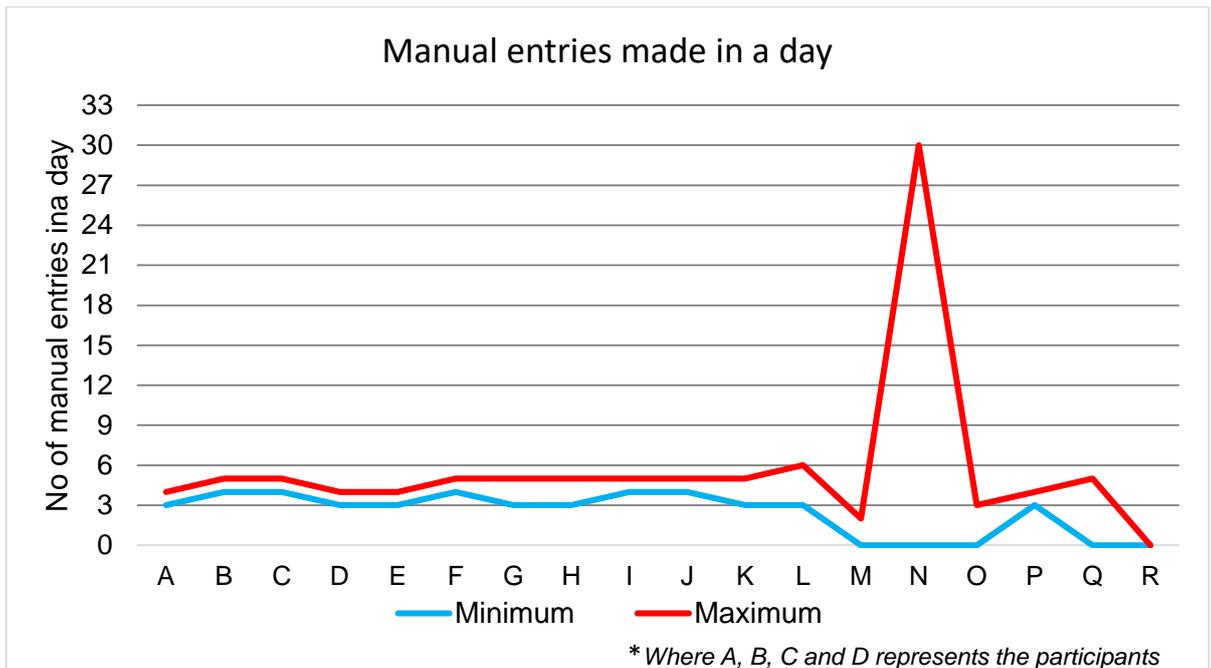


Figure 3: No of manual entries made in a day

Companies like Hindustan Unilever, Coca-Cola, Nestle, Titan, Pepsi, and Britannia are using SAP as their ERP (Singhla, 2014). The observed primary data also confirm the same. Apart from these main players, other manufactures use Microsoft dynamics, Oracle e-business suite, and Ramco Logistics ERP. Though these are advanced software, 38% of participants who use this software are not able to keep records about their stock transfers.

Witnessing the potential benefits of ERP, companies are now investing in up-gradation and in fresh implementation of ERP systems in their mainstream supply chain from raw material to logistics (Kiran and reddy, 2019). The analysis also reveals that an ERP system needs to be customized according to the need, nature and their use within the organization to improve the efficiency of data flow in the ERP implemented organization.

Upon secondary data analysis earlier studies shows, companies are facing a challenge in implementing ERP in their organization. Madapusi and Ortiz (2019) and Menon et al, (2019) both studied the critical success factor in implementing ERP in the growing organization. The main challenge faced in these organization remains to be a lack of knowledge of the executives, who failed to understand the essence and importance of the flow of information

(Intra and inter). Instead, they do them manually in a spreadsheet where the access is limited to one department resulting in failure.

4.2.4 Geographical location of Warehouse :

This segment of the paper discusses the critical parameters that are to be considered in selecting the location of the warehouse. Soon after the implementation of GST, the need to have warehouses in each state has dissolved. Central warehouses (CWH) and regional warehouses (RWH) of the organization can be positioned strategically to reach the market with minimum lead time. The location is either decided based on the market size or distribution pattern.

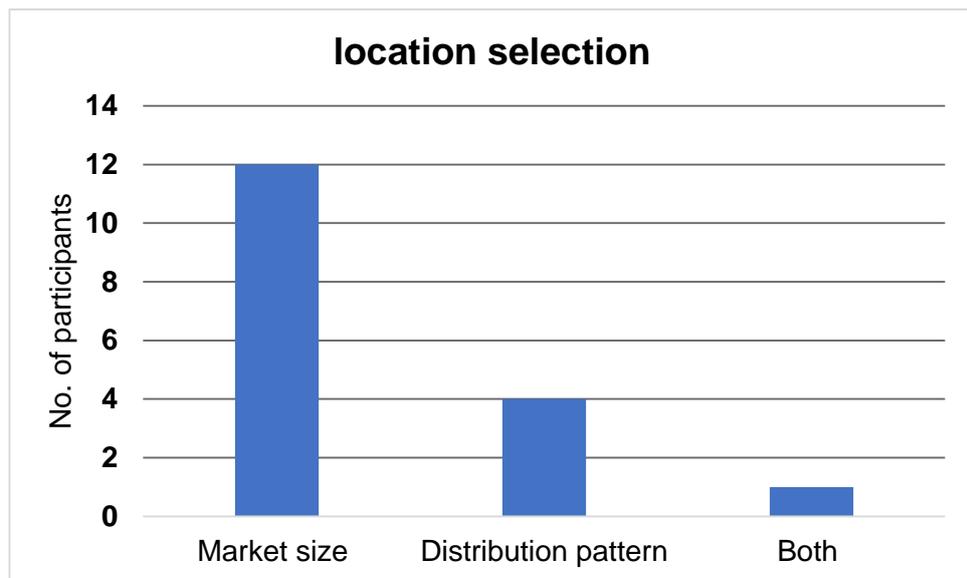


Figure 4 location selection.

The distribution of goods to the retail stores in the south Indian market is done by third party logistics (3PL). Even key players in the market prefer to use 3PL for distribution in relation to the 3PL a manager replied "Distribution in south India, particularly in these three states (Kerala, Tamilnadu, and Karnataka) companies are having the bargaining power to choose the 3pl and also the flexibility with them. If a company runs the entire distribution network profits margins are challenged". The benefits with the 3PL are they can save money and time. For example, a truck operated by a 3PL collected

different products from different warehouses and drop them to one particular store, saving cost and fulfilling demand. Organizations also find them efficient, such method helps in reducing time and the carbon footprint. Where reducing carbon footprints have become corporate social responsibility (CSR) for many companies.

Market size is the single entity that the majority of the supply chain professionals are concerned about in choosing the geographical location of WH. Losing a sale to a customer cost the firm high, rather than anything. FMCG products are customer-centric, they need to be available in stores at all time. Market size becomes the dependent variable that needs to be addressed on a daily basis. Interaction with the warehouse executive says “ The market share that we hold now is the collective effort from market analysis, marketing strategy, plan for ROI and the satisfaction of the customer. One minor disturbance from supply chain would affect the entire structure of business”. Location of the warehouse is considered to be a strategical point that should be precisely decided.

From the primary analysis, 88% of the total participants have an idea to centralize their warehouse. Through the eyes of senior associate, “ Replacing 4 warehouses with one centralized WH will slash out the overhead cost of 4 and in such case, we would need an effective ERP and a well-designed inventory system”. Considering market size to be a single parameter that influences the idea of centralization and decentralization. This decision again questions the ability of SC in satisfying external demand, ability to reach market and customer satisfaction.

4.2.5 Lead Time Management :

From the collected responses, companies have scaled down their lead time and still finding ways to reduce them. There are challenges in reducing the lead time, “ The distribution pattern decides the lead time of the product delivery, increase in distribution leg increased the lead time. But not all distribution can be short-haul but an optimal design will provide a solution” reports a manager -inventory controller.

Lead time is really challenged when one WH is distributing products to two different markets. A WH located near the border between two states experience a difference in lead time. Interviewing the senior manager says that “ we are working with products to distribute to Tamilnadu and Kerala. There is a reduction in the lead time in Tamilnadu but lead time increases in Kerala. The reason being the hill stations that we address. However, we are not really worried about the lead time in Kerala. Because having a warehouse for a small market will bring down the ROI”.

Lean and JIT explains the need and provides a framework to reduce the lead time, but this philosophy of SC is not directly applicable in south India. The difference in buying behavior, location of stores brings in challenges. 66% of the total respondents are witnessing a reduction in the lead time. The rate of reduction has increased after the implementation of GST. The general manager of SC added that “ During the cascading tax structure the transportation vehicles (container trucks and lorries) are made to wait for a long time for clearance of tax papers causing a significant delay in delivery. Unified tax structure reduces the waiting time as they pass the tolls- we are happy about it”. Reduction in lead time is directly measured in terms of profits, GST has led to an average cost saving from 3-7% across different industries(Knight Frank, 2018).

The other side of the business spectrum is the ability to reach more customers (through vendors). The ultimate aim of the supply chain is to reach the customers on-time and avoid stock-outs. Out of 18 participants 12 participants agree to a common point that they are able to reach more customers, “the amount of the replenish order that we get from the particular vendor is the key measure of consumption , some times orders are delivered beyond the forecasted demand (for usual products)” added the warehouse manager. A very particular response from the general manager- SC was,” the rate of satisfaction of the product lies with the quality and the price of the product that is monitored by the marketing team. But we ensure that a customer who looks for our product is able to shop the product. That’s our key performance indicator (KPI).”

4.3 Limitation:

This particular study is subjected to some technical limitation as follows:

1. The focus of the study is limited to first-tier logistics, from distribution to stockist. This would be not applicable to E-commerce.
2. The taxation structure cited is recent as of July 2019. It needs to be studied again if the tax levied on FMCG products are changed.
3. The study is conducted on a company-owned inventory and distribution network. Third-party network(3PL) providers are not taken for study.
4. This study is conducted on the existing products in FMCG, not on the new introducing products.
5. The research helps in understanding the inventory management for FMCG until the supplier end, it does not cover the rate of customer satisfaction on a marketing perspective.
6. The study is limited to business to business (B2B), it has no relation to any aspect of the customers.

The discussed method of inventory management, location of the warehouse selection and the count of lead time are not applicable in the event of any natural calamities. In Tamilnadu, Chennai had a severe downpour followed by a flood in December 2015, disconnecting the city from the rest of the state. medical support and food supplies were in short (Narasimhan, 2015). The acute problem in such a scenario, the marketplace has more demand but the ability to reach the customer becomes more challenging (close to impossible). Such floods happened in Cuddalore (a district in Tamilnadu) in 2015, Chennai in 2017, Erode, Thanjavur, Tiruchirappalli, Nagapattinam and again in Cuddalore during 2018 (Sharma, 2018). The state of Kerala was recently affected by flood from the monsoon rain, this tickled uncertainty throughout the SC. (Al Jazeera, 2018). Natural calamities are a reality, impossible to predict and inevitable. During the disrupted situation, the demand of the consumer increases and the retained inventory are not distributed to the

marketplace. This study does not analyze any kind of such situations and the findings do not hold good in the above-mentioned scenarios.

Chapter 5: Discussion.

This part of the paper discusses the result based on primary and secondary data collections. From the secondary data sources the introduction of Goods and Service Taxation (GST) has brought a major opportunity for inventory management and in centralizing the distribution warehouses of Fast-Moving Consumer Goods (FMCG) sector. Right of this moment the structure of Indian FMCG is unorganized, disperse and they are subjected to change with demand (seasonal and non-seasonal products). The model of SC and inventory management different from one manufacturer to the other, as the tax on goods, differed from state to state (pre-GST). But after analysis from the published papers an effective inventory management model is figured, and its applications are successful. Floating stock inventory management is a widely used method of handling stocks post GST.

Based on the primary data collection, from the interviewed participants 50% of the participants are using the floating stock as their stand-alone method of inventory management. The other 30% of participants are using a hybrid model of floating stock coupled with the base stock model, first-in-first-out (FIFO) and cross-docking. Choosing the second model depends on the nature of the product, seasonality of the product and external demand. Models like cross-docking, base stock, and FIFO were in practice but after GST all companies want to operate with optimal inventory finding floating stock as the solution. Post GST the taxation has almost no influence on the product held as stock. And that has become favourable for inventory handles.

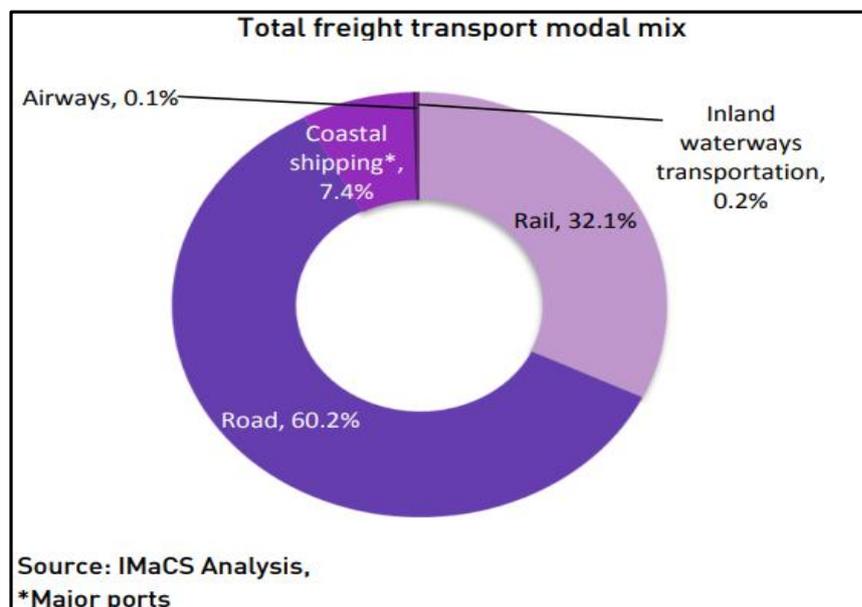
There are various parameters that are to be considered when choosing the method of inventory management. They are the size of the firm, profitability, policy of safety stock, speculation stock, in-transit stock (pipeline stock), distribution behavior, external demand and customer satisfaction. By doing a root cause analysis (fishbone diagram). The stock holding in the warehouse depends on the external demand in the market, but not on the market size. The market size only applies to the metropolitan cities and are considered while launching a new or a premium product

in the market. To meet the demand, SC experts are more stipulated about the amount of on-hand stock. Warehouse executives only consider the in-transit and the stock in the warehouse as their on-hand stock, anything apart from that is not under their control. Either such stock is billed or not having a sale order.

Following the inventory handling the second challenge comes with the distribution network and the flow of information that facilitates the network.

5.1. The distribution complexity.

The landmass of India remains to be a single large entity providing an advantage for the roadways. The network of roadways for the logistics is supported is still under development.



Source: IBEF report 'Indian logistics industry: gaining momentum'

Inland distribution in India depends on the roadway to reach the market. The rate of growth of market demand and the ability of logistics to reach them are still not synchronized. The volume of transportation that is locomoted to the marketplace is not supported by the condition of the road and the infrastructure. Therefore, companies plan for short-haul distribution and distribution with more drop points. From there the 3PL's carry them forward. The best strategical option for companies to reach the market is through third-party logistics (3PL) as companies have more options in choosing the performer with minimum lead time. The unified tax structure

has re-established seamless connectivity of logistics and providing a more general pattern of distribution. As analysed from the participants, regardless of the inventory management, the distribution network remains to be a structure of hub and spoke model where the tier in the network increases depending on the distance in the distribution chain. But some peculiar distributors do follow direct distribution for branded and launch products as they need to get the feedback and the run a market study on the product.

5.2 Enterprise resource planning (ERP):

One critical issue that FMCG sector face today is the flow of information, due to the lack of technology to drive material management. Among the interviewed participants only 61% of them use an ERP system of any kind. Though a high percentage of the companies have an ERP in place they are still in the primitive stage. Updates on the live stock transfer, frequency of manual entries, ability to view and access the location of the SKU's in the warehouses are the common issues witnessed across the sector. The ecosystem of finished goods inventory management, distribution pattern and the location of the warehouse are connected by the flow of information that is shared between them. Every company that is in the competition are ensuring the effective use and implementation of ERP in place, but this is limited within the company. In the big picture, the 3PL also play an important role, ERP's are not connected with the 3PL pulling the efficiency down.

5.3 Research Objective:

The primary objective of this study is to understand the formula or pattern of finished goods (FG) inventory management that is measured in terms of cost and return of investment (ROI). FG inventory is associated with the distribution pattern, flow of information and the location of the warehouse that becomes the strategic point in attaining more customer satisfaction. The term of the satisfying customer in this context is the ability to reach the customer and to avoid stock-outs. From the findings of the study, the model of inventory management followed in south India (single and hybrid model) are effective in the way they manage their inventory. Added, the reframed tax structure is beneficiary to the distribution network. Almost every business that transacts within the state and crosses the state is witnessing a

reduction in the lead time. Particularly the goods that are carried interstate are able to reach the marketplace on time.

Cycles of sales are indicators of customer satisfaction and the availability of the product in the market. Analyzing the responses from executives, 12 of 18 business is able to attain customer satisfaction. To attain the maximum ROI companies, stick to the below trend for each of their market.

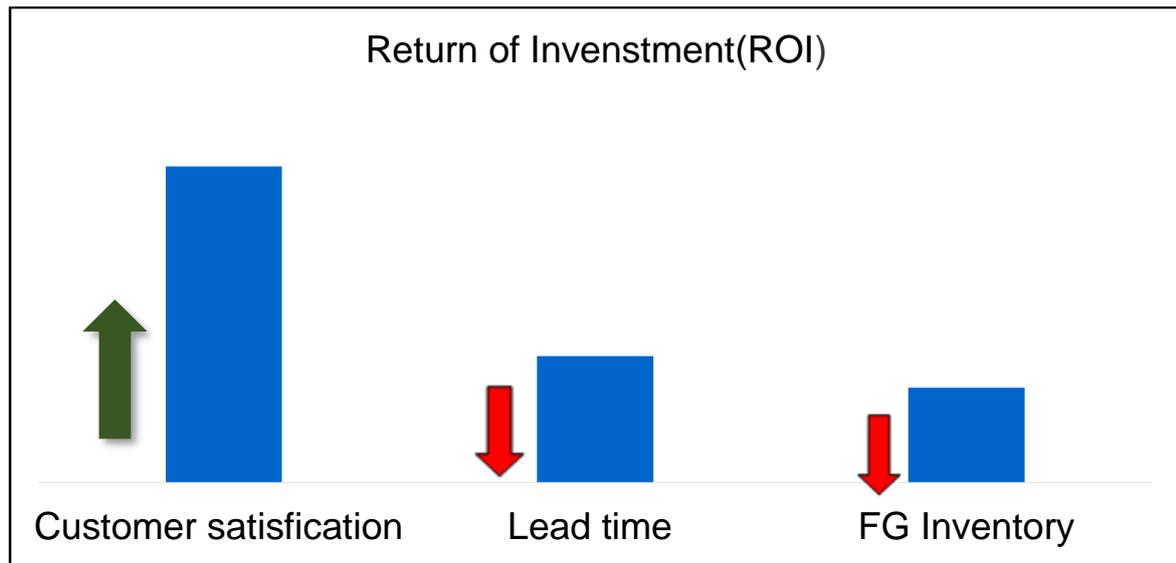


Figure 5: Return of investment

Low levels of inventory and lower the lead time along with high customer satisfaction forms the bedrock for maximum ROI. Every day in the business starts in balancing these key parameters.

The customer remains to be a centric point for every business and all activities are carried to satisfy them. The term of the satisfying customer in this context is the ability to reach the customer and to avoid stock-outs.

Deciding the location of the warehouse after GST remains to be a strategical decision of SC. The location of the warehouse depends on the market size. Be it rural or urban market the potential ability for sale determines the location. GST has given an opportunity to centralize the warehouse, which again brings down the economy of scales in having many warehouses in different states.

Every factor that contributes to the increased and decrease of the return of investment are analysed in this study. Going forward with this pattern of tax,

companies will have a single warehouse of larger space and reduction in the inventory that they hold.

Chapter 6: Conclusion:

This research has successfully investigated the method finished goods inventory management in the Fast-moving Consumer Goods in the south Indian market. This research brings in the insight of understanding and the pattern(method) of inventory management followed in FMCG, along with the factors that affect the efficiency of the SC network. This study also throws light on the factors that are crucial and need to be considered in improving the return of investment (ROI) of the company.

Concluding from the research findings, companies are reinventing their feasible method of inventory method. Of which floating stock methods used widely. Some companies are following a hybrid model as the product changes. All these models are efficient in reducing their on-hand inventory and facilitates a seamless flow in the distribution network. FMCG sector has benefited after the implementation of GST in the way of handling inventory, movement of goods across the border and in their ability to reduce lead time. Distribution is made easy by adapting to a hub and spoke model. Although there are many positive changes after GST, the inventory and distribution are struggling hard due to the lack of information flow within the organization. Companies need to address all related issues with ERP to improve efficiency.

6.1 Recommendation:

The study has discussed both the growth and challenges of SC in the south Indian market, the prime recommendation points out for the improvement of ERP and warehouse management for this dynamic market. There are various factors that affect the implementation of ERP in south Indian FMCG, but companies need to find a way of bringing them into operation. The large portion of the paper discusses the inventory management. Inventories are always carrying a cost to the company. It is advised that SC need to revisit its method of inventory management again in regular intervals of time, either to have a single model or to have a hybrid model. This varies with the nature of the product that the warehouse handles.

6.2 Opportunities for Further Research:

This research is particularly focused only on the FMCG products that are handled in the market of south India. Focused on the states of Tamilnadu, Kerala, Karnataka, and Andhra Pradesh and concentrates only on the company-owned distribution network. Furthermore, apart from inventory management and ERP, the location of the warehouse remains to be a strategical decision for companies to reach the market. Location brings a competitive advantage for business for which further research is required. Along with this, the factor that remains as a barrier for ERP implementation also needed to be studied in the future.

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8. Appendices.

8.1 Appendices - Interview with the senior inventory controller.

During the interview process with the senior associate in a warehouse said that the new taxation structure has given the opportunity to improve for better supply chain management practices. There are evidential tangible and intangible benefits out of Goods and Service taxation (GST). The inventory holding methods of the warehouse solely depends on the area of distribution, and now taxes no longer affect the movement of goods across the border. The model of inventory holding depends on the nature of the product that we handle in the WH. In this particular warehouse, 40 % of the product is obsolesced- the shelf life of the product is different from one another, for which we use First in First out (FIFO) method. We don't stock them beyond the buffer control. But we keep a keen observation of these products. These products are moved to the warehouse depending on the forecasted sale in the external market.

The remaining 60% of products are floating stock. Fast Moving consumer goods (FMCG) are encountering high cycles of sales, the ability to reach a market having optimal inventory can only be achieved by floating stock. The distribution pattern has changed a lot after GST. We have multiple levels of distribution to reach the market. The stickies whom we distribute handle many products, so to reach the superstore we distribute them directly. A distribution that is planned by the company is short-haul, there is variation when it comes to third party logistics.

The overall SC is connected by an ERP system (local connection), that is customized according to the product variance. The medium of communication is carried through the phone as only a certain degree of the distribution chain is controlled by the company. Though they have a local system to manage the data, 30% of entries are manually made. After understanding the benefits of GST, centralizing the warehouse will benefit the SC in terms of inventory handling, reducing the lead time and in increasing the return of investment (ROI).

8.2 Appendices - Interview with the General manager.

Interviewing the general manager of inventory management said that, the new GST has cleared the hurdles of distribution across the border but the activities within the state remain the same. The inventory holding depends on the market size that we address. The products in our inventory are bit premium product concentrated towards the disposal income so, we go with market size rather than external demand. To handle the market the stock holding in the hand should support us. We use two methods to maintain the inventory – floating stock and cross-docking. Cross-docking is used only for particular products for which we do have a reserve in the warehouse. After GST we have increased the buffer limit as there is some situation that demanded it. The remaining are floating, having an on-hand stock depending on the pull in the market. The real challenge is faced in the distribution channel, using a hub and spoke model gives the advantage to reach the market. To sustain this model there is always support needed from the 3PL.

Both inventory and distribution network is in line with the help of the ERP system that we have. The system is interconnected with each department, required to fuel the SC. The sale order released from the sales department is communicated to the SC and to the production department. Even our ERP is found fragmented in a listing of stock and in recording the movement of goods from CWH to RWH, works are carried in correcting them. Put together we have evolved a lot in our inventory handling method, the distribution pattern and in ERP, all these are done to achieve the goal of decreasing the lead time. According to the last quarterly report, the overall lead time in our zone has decreased. Future plans are being devised to centralize the warehouse to gain a strategic advantage of the market.

8.3 Appendices - Interview with the senior associate in a warehouse operation.

While interviewing the participant, GST has helped them in solving their problem with their inventory model as well as with the distribution pattern. To reach the nearby states trucks and lorries has to wait for hours (even days) to clear the checkpoint. New GST has made taxation easy for transportation. The inventory model in this warehouse neither depends on the market size nor the external demand. The goods are moved to the stockist position depending on sale order, which means we

replenish the stocks for the market and keep satisfying the external demand. To achieve this flow hybrid model is used -floating stock and FIFO. The distribution location also plays a major role in deciding the inventory model, where the distribution is limited to the first tier of distribution (first tier distribution refers to the stockist who receives goods from CWH) the from stockist they are taken care by 3PL.

This system of SC is facilitated by an integrated ERP system, which is capable of recording stock transfers. Stock transfers remain to be a critical parameter that needs to be essentially recorded in the system. But this ERP is fragmented in maintaining the replenishment orders. Apart from one particular fragmentation, performance ability has increased with the support of an integrated system. Successful reduction in our lead time and the ability to reach customers has increased recent days providing an increase in ROI. Along with this future plan are considered in centralizing the warehouse depending on the proximity towards the market.

8.4 Appendices -Interview with the Warehouse manager- Regional Warehouse.

Unification of tax structure has reduced the burden for movement of goods within the states of south India. Transforming the nature of holding inventory and distribution. Following the floating model helps in addressing the sales with minimum optimal inventory, followed by distribution. The market of Kerala is geographically diverse with hills and plains, in such market distribution is customized according to the pattern of demand. FMCG are profited by the increases in the cycles of sale, hence the potential market is selected.

Support from the ERP serves as a spine for the business in this region. The primitive ERP is able to record data from the scanned products, but with 150-160 products variance, not all the products are recorded. An improved one can improve efficiency. We are consistent with the performance in the supply chain, where the lead time and the ability to stratify the customer remains the same during the last half-yearly.

8.5 Appendices - Interview with the Manager – supply chain.

Post GST, floating stock and cross-docking model are result fetching in terms of reduction in the lead time and the ability to address the customer needs. As the length of the distribution increases multiple hubs and poke model remains as a solution. A third-party ERP system help in information support for the whole of the organization facilitating in stock transfer, replenishment and in accepting sale orders. A small improvement is required in recording and viewing of all the SKU's in the WH.