

EFFICIENCY MODEL FOR THE PROLIFERATION OF SECONDARY MARKET SUPPLY CHAIN – WITH REFERENCE TO THE INDIAN GARMENT CLUSTER

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Abstract: The growth of secondary market in retail garment trade has been a major boost to economic growth in developing nations. This paper highlights the importance of effective forward and reverse supply chain the garment sector as driver for this booming secondary market. A conclusive research technique has been adapted to study the supply chain practices followed in the garment business those in the primary and secondary market. Structural equation modelling is used to validate and test the proposed model for supply chain performance. Cluster sampling method was incorporated. Owners of garment manufacturing firms in and around Coimbatore, Tirupur, Salem, Bargur and Bengaluru region would form the respondent group. A structured questionnaire was given to them to understand their supply chain practices, supply chain flow velocity and flow efficiency and its impact on their business performance. The firms operating under uncertain circumstances in the secondary supply line have adopted practices which lead to appropriate velocity and efficient flow of money, material and information which has been proved through the testing of the model. The velocity and efficiency in the supply line has improved the performance thereby ensuring a more sustainable business for the firm operating in the secondary markets. This study has contributed in understanding the various dimensions of best supply chain practices and its effect on the flow velocity and flow efficiency of the money, material, and information in the secondary market garment supply chain. An assessment of the results of the study has opened a window to the operations of the secondary garment supply chain line in the Indian cloth market which have been more or less camouflaged under the primary market operations. The outcome of the research also shows that these secondary market players have evolved their own strategies to sustain in volatile and uncertain circumstances. These strategies have proved to be very effective in minimizing wastage and increasing profitability of the manufacturing firms. The implications of this study is bound to give much needed support and leverage to the frail and underperforming secondary garment cluster which is a major contributor of Gross Domestic Product and employment ratio.

1 Introduction

The Indian garment value chain has spread across organized and unorganized segments increasing overall competitiveness (Sudeshna Chattopadhyay and Sarmishtha Sen, 2018). Recent studies have shown that retailers focus more on delivering value to their customers through their strong supply chain to win over their immediate competitors. The supply chain management (SCM) has gotten extremely basic to oversee the hazard and complexities of worldwide sourcing. A completely coordinated supply chain is required for the organization to pick up the most extreme advantages. The goals of the supply chain and its performance should be comprehended to assemble the best supply chain. Performance's estimations give a way to deal with distinguish the achievement and capability of supply chain management systems. One significant part of the supply chain management is to choose the correct source of supply in the worldwide business condition that can bolster the

corporate system. In opposition to the traditional ill-disposed connections, powerful supply chain management in the new rivalry proposes looking for cosy connections in the long haul with a fewer number of partners.

Reverse supply chain takes place in the opposite direction to regularize the flow of material, money, and information. The reason being either to recycle, return, or repair a product. Returns of material were generally accepted for maintaining the reputation of the firm through customer satisfaction which in turn helps the firm to maintain its market reputation and thus achieving sales turnover. Recycling was favourable in two ways; to reduce the raw material requirement which in turn minimizes the cost involved and likewise helps in the disposal of damaged materials. Reverse supply chain solves two vital purposes: creating high – value recovery and low – no value recovery. Value creation in the second life retailing has thus lead to the growth of secondary garment market.

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This study was carried out in the western region of Tamilnadu and Karnataka state of India, predominantly in Coimbatore, Bargur and Tirupur districts which are well known for their garment manufacturing clusters and have been nick named as the Manchester of India. Much of the garment manufacturing firms are located in sub-urban towns and in rural villages in this region. The products manufactured in these remote locations depend heavily on logistics and supply chain to reach the consumers on time to meet the growing demand. The manufacturing firms located in Coimbatore and Tirupur are facing problems due to bulk storage, rising inventory cost, labour shortage and disruption in the supply chain network. The present economic condition due to the pandemic situation has led to stagnation and piling up of large quantity of stock. Because of the uncertainty that exists in the functioning of the supply chain back to its original capacity, has been a cause of concern for many of these firms. The huge stocks at the go-downs have been subject to damages and have increased the wastage. This situation has curtailed the cash flow at every node of the supply chain. Under normal circumstances these products which fail quality test and show minor variations in terms of the product consistency make their way into reprocessing units and land up in the secondary markets for sale. A continuous supply to the secondary markets is a strategy that has been followed by many of these garment manufacturing firms over the years to minimise the loss caused due to improper product output, to ensure cash flow and profitability. The products obtained from these primary manufacturers have to go through reprocessing and land up in the hands of agents and dealers who in turn pass it on to the secondary retail cloth merchants and street markets. The current pandemic situation has strangled the supply chain of these secondary markets because of nil demand and low purchasing power of the lower middle-class segment who are consumers for these products. This unforeseen situation has disrupted material, money and information flow within the secondary supply chain leading to closure of many of these reprocessing units, dealers and agents. The skilled labour force which have come down to work in these manufacturing units and secondary line of operations have migrated to their native locations in the north of India leaving a void for skilled labour. Many of these secondary markets discussed in this paper have found ways to customize their strategies to survive and sustain in this uncertain period. Careful observation and a vivid reading of the literature has prompted the researcher to narrow down to study certain variables pertaining to the secondary market supply chain. The variables impacting this study on secondary supply chain are supply chain practices, supply chain performance, flow efficiency, flow velocity and business performance.

2 Literature review**2.1 Reverse supply chain**

Fleischmann et al. (2000) features the developing significance of Reverse Supply Chain Management (RSCM) essentially on understandings for abundance items and broadened maker obligations. As understandings for overabundance items are related to item returns, which can be exceptionally high in certain ventures encountering returns at more than 50 percent of deals, broadened maker obligations manage expecting organizations to successfully deal with the whole existence of the item. The secondary market an extension of the primary market and contributes to the second level in the value chain process. Reprocessed products are sold in secondary markets for additional revenue, often it is offered to a market segment where the purchasing power is comparatively low and shows less importance to branded commodities.

The presence of secondary markets of remanufactured variants of items and the cannibalization impact of the secondary market on the new items decides the main concern of Reverse Supply Chain Management (RSCM) activities in the various enterprises. As supply chain members improve their relationship management and create trust, they search for chances to improve supply chain execution estimates, for example, cost, quality, speed, flexibility, and sales turnover (Selnes and Sallis, 2003). With regards to supply chain frameworks, recent works show that trust diminishes process duration (Handfield et al., 1998) and builds flexibility, stock turnover, and satisfaction rates. Handfield and Bechtel (2002) found that trust in a supply chain relationship can improve provider responsiveness. Improvement in characteristics like responsiveness, reliability, practicality, exactness, and critical thinking are identified with upgrades in the performance of the supply chain. It tends to be concluded that a nearby working connection among manufacturers and their suppliers that incorporates trust will decidedly influence the performance of the supply chain. (Mahour et al., 2019)

Fleischmann et al. (2000) base the developing significance of Reverse Supply Chain Management (RSCM) fundamentally on understandings for overabundance items and broadened manufacturer duties. As agreements for overabundance items are related to item returns, which can be extremely high in certain enterprises encountering returns at more than 50 percent of sales, broadened manufacturer duties manage expecting organizations to adequately deal with the whole existence of the item.

Research on the reverse supply chain has been increasing ever since the 1960s and research on technical aspects and models on reverse co-ordinations started to emerge in leading publications during the 90s. Rogers and Tibben-Lembke (2001) shed new light into the current

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comprehension of reverse co-ordinations, some of which were broad and included supportability, income upgrade, and cost decrease. Carter and Ellram (1998) clarified that three basic intra authoritative exercises that crash into reverse co-ordinations: promise to natural issues, moral principles, and arrangement business visionaries who embrace an ecologically neighbourly way of thinking.

Traditional forward supply chain functions in such a way as to satisfy a customer as a final destination. Whereas, the reverse supply chain starts its operations right from the customer as an initial focal point. Guide and Van Wassenhove (2009) in the concept of Reverse Supply Chain had considered five interconnected processes: product acquisition (procuring used products), reverse logistics (movement of the used products from the market to sorting factory), product testing, recovery operation and remarketing.

Guidini (1996) had explained that the reverse supply chain helps in recapturing and recovering the value of the used products and thereby intends in the development of a new market which leads to lower pollution levels in the environment (Lee et al., 1995). Huge consideration is being given for reverse logistics because of considering its benefits and enhanced value creation.

2.2 Growth of secondary market supply chain

Reverse supply chain has emerged as one of the major driver for the growth of the secondary markets in the textiles industry. The secondary garment market is booming and could overtake fast fashion, according to ThredUP's annual resale report (2020). Secondary garment market has just released its annual fashion resale report, and the market is booming. ThredUP reports that, over the past three years, secondary markets had grown 21 times faster than apparel retail. The secondary garment market, currently worth \$24 billion, is expected to reach \$51 billion in five years. Growing numbers of shoppers are willing to buy secondary garments as the stigma associated with used clothing disappears. Millennials and boomers do the most second hand shopping, but Gen Z'ers (18-24) are the fastest-adopting group. More than 1 in 3 Gen Z'ers will buy secondary garments in 2019. Overall, 64 percent of women say they're willing to buy used apparel, shoes, and accessories, compared to 45 percent in 2016. Most exciting is that this secondary market is stealing revenue from fast fashion, an industry that is notoriously unsustainable. In fact, ThredUP suggests that the resale market will overtake fast fashion if it continues to grow at this rate. Moreover, the secondary garment market doesn't just involves sale of used cloths, but includes the products which were produced as excess goods or surplus and goods with mild defects.

2.3 Cases of efficient secondary textile market in India

2.3.1 Bargur

Bargur (Barugur/Barguru) also called mini-Surat is a town panchayat and taluk located in the Krishnagiri district, Tamilnadu, State of India. The economy here is well known for the textile trade, granite imports, mango cultivation, and export-oriented processing industries. Not only that, but the main importance of this town also comes from its secondary markets for garments. Customers from various towns and metro cities flood to this town to buy garments that are branded but find their way to this secondary market.

A shopkeeper named Mr. Hari having a textile outlet in the Bargur market for nearly a decade was interviewed. He narrated the risks and rewards that one can get it from the industry. From the narration, it was inferred that most of the products were purchased from Delhi, Agra, Mumbai, Surat, Chennai, Kochi to Chickpet. Based on the different trends and fashion in the market. The market trends are being updated to the suppliers through the agents and the agencies. The market had seen goods from various places and through various sources. Bargur market is also called a grey market as it sells smuggled goods through its efficient hidden supply chain. The market is also a hub for reprocessed garments. The interviewee vetoed to talk more about the smuggled goods and its supply chain. The Bargur market mostly had people who are interrelated within a community. It was very difficult for a person to go and find the traces of the supply chain and their suppliers. The supply of goods also included rejected goods from various ports and manufacturing units and re-processing units. The Bargur market had a very special element that is the credit purchasing of materials. The credit was given by most of the suppliers as the business was carried out within a close-knit community, the market itself holds as a guarantee for the purchases made by the shopkeepers.

The maximum credit time duration was approximately 60days. Only a few shopkeepers who faced financial crunch informed their market leaders well in advance and sold their products on credit. If there were issues in the payment the market leaders would take appropriate actions to get back the dues. The shopkeepers preferred to go as a group for the purchase of stocks as they get an extra discount for the bulk orders. They pay a certain amount for the order confirmation and pay the balance when the goods are received. The logistics are taken care of by the suppliers. The goods reach the place within the stipulated time in most of the cases. The suppliers are connected through the agents and agencies who act as intermediate for the sales. These agencies and agents receive a certain percentage of the amount as a commission from the suppliers after the sales and final amount later the due is paid. The damaged goods are collected at a point and are given at a very minimal cost to the roadside vendors. The

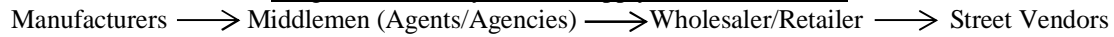
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roadside vendors usually get the goods once a month from the collection point. The unsold goods are returned to the

suppliers and are exchanged for the latest goods in the market.

Bargur's Secondary Market Supply Chain Flow Chart



The Bargur market witnesses customers mainly from metro cities like Bangalore and Salem who are brand conscious. They come down to Bargur to purchase formal wear and casual wear. The market witnesses around 2000 to 2500 customers flowing in every day. The sales are up to 15% to 25% of the investment daily. The market has shopkeepers who sell in bulk quantities and do not prefer retail sales. The shops are of various sizes and are mostly owned by private players and very few are run in government leased buildings. The shopkeepers preferred to do transactions in cash as most of their dealings are covert. The return on investment is high in the industry when compared to other industries. This market thrives on low investment and enjoys high returns as compared to the primary market for garments.

2.3.2 Chickpet

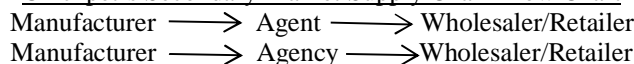
Chickpet (Chikkapete), Bengaluru's core commercial area for more than 250 years is one of the oldest shopping destinations in India, which is popular for saris that find takers even among the Mysore royal family. It is well known for wholesale and retail apparel shops. Chickpet is popular among the people for its variety of sarees, silver, and gold jewelry which are available at an affordable rate. The shops here have an average size of 100 sq. ft., the outlets enjoy 15% to 20% of return on investment, irrespective of the economic conditions.

Interviewing a shop owner in the market named Mr. Kailash, it was understood that the shop keepers in Chickpet mostly purchase their stocks from bigger markets like Delhi, Agra, Mumbai, Surat, etc similar to Bargur based on the variety. Moreover, the shopkeepers themselves are updated with the current fashion trends. Chickpet shopkeepers purchase the rejected and damaged apparel from the manufacturers who produce for leading brands. Goods that lack quality, the ones which are varied from the ordered colors, which differ in size are being purchased. These manufacturers who manufacture for brands are said to hold a maximum of 50,000 units of

damaged and rejected pieces on an average per day. These pieces are sent out of their unit through agents and agencies who act as middlemen between the manufacturer and the wholesale/retail shop keepers.

These agents are said to have a commission on the sales volume. Once, the goods reach the wholesaler/retailer the payment is made directly to the manufacturer and it's the manufacturer who pays the agent a commission. Few transactions happen on a credit basis as well, for which the agent is held liable for surety. The credit terms are being fixed based on the firm's reputation and assurance given by the agent. Delay in payment will lead to higher interest rates and vice versa. All the agreements, terms, and conditions are framed orally and not in written format. The important thing to be noted is that it is very little or sometimes zero bad debts in these supply chain formats. The agency also acts as an official mediator between the two parties. The manufacturer sends the bill to the agency who then adds a certain percentage and then sends the agency's bill to the wholesaler/retailer. The wholesalers/retailer makes the payment to the agency and the agency settles to the manufacturer. The agreement, terms, and conditions are in a written format when an agency is involved, but the sad truth is that the bad debts ratio is slightly higher compared to the involvement of agents. The astonishing fact is that there is no loss in the whole chain of process and everyone connected in the chain will be able to take back his whole investment. Though the shops in the Chickpet market are closely connected and are nearby. They manage to sell their goods as expected. The shop keeper sells a minimum of 5 pieces per order and not less than that and their accounts are still maintained through books of accounts and ledger despite the growth of technological advancements. The customers for this Chickpet market are mostly retailers from other parts of India and women entrepreneurs who sell online and offline. The shopkeepers at Chickpet do accept the unsold goods from their customers but they don't return cash instead a new set of products is offered.

Chickpet's Secondary Market Supply Chain Flow Chart



2.3.3 Tirupur (Kadarpet)

Tirupur a small city located on the banks of Noyyal River in Tamil Nadu and is the fifth largest urban agglomeration. It is positioned at the center of the South Indian Peninsula, about 450 kilometers southwest of the state capital Chennai. Tirupur was an agricultural town

with irrigated farms. During the 1970s those farmers became the owners of various textile related units. The step by step growth of the textile industry paved the way to an interwoven network of small scale units to grow into a big giant and thus made the city grow as a major textile hub. Tirupur is now a major hub for textile and knitwear

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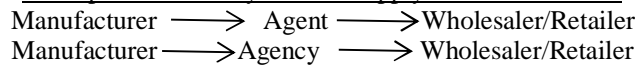
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contributing to almost 90% of total cotton knitwear exports from India. It has therefore transformed into a large employment generating industry for over six lakh people.

By interviewing a domestic textile manufacturer Mr. Mohammed Shafi, who is in this field of textiles for more than 25 years, it was understood that he had customers coming from varied parts of India like Hyderabad, Bengaluru, Mumbai, Delhi, etc. It was fascinating to know that each customer approached with a bulk order quantity which comes close to around fifty lakh pieces per order. Primarily, their customers are acquired through marketing activities carried out by themselves and also through agents/agencies. The agencies help manufacturers to get orders from customers. Agencies are found to act as

middlemen between the manufacturer and wholesaler/retailers. Acquiring customers through agencies act as an assured platform in terms of payment guarantees. The wholesalers or retailers are given a maximum of 45 days credit period based on trustworthiness, however, if it's a new client they had to make an advance payment. If their repayment crosses 45 days, interest is being calculated accordingly. The manufacturer is the one who pays the commission to the agency. Transportation of goods is taken care of by the manufacturers, themselves through their regular logistics service providers. Each piece is sent out along with price tags. Defective pieces are collected separately and are sent to a separate secondary market.

Kadarpet's Secondary Market Supply Chain Flow Chart

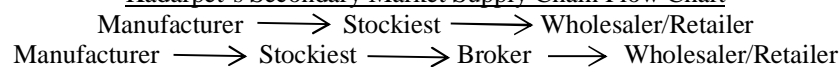


Mr. Mohammed narrated that there arise situations where a huge volume of material around one lakh pieces had been rejected by the customer. To overcome losses those rejected pieces were sent directly to Kadarpet (secondary) market. He states that regular customers for these secondary markets are generated through word of mouth. The customers are responsible for the lot they purchase in these markets. No returns would be encouraged. These secondary domestic market's design requirements keep changing twice a month. Therefore designs are all predicted and procured in these markets. This market exists because of cash to cash transactions. No credit would be encouraged. The return on investment will be around 15% to 20%. The manufacturers like Mr. Mohammed usually send the defective or rejected pieces to these secondary market through agents or brokers.

enjoy huge profits serving the middle class. The interviewee had more than 23 years of experience in this field and he is a stockiest had both wholesalers and retailers as his customer base. He stocks all kinds of garments for boys, girls, men, women, and kids. Therefore a large number of retailers and wholesalers who deal with secondary markets would turn up. He procures rejected and surplus garments from multiple garment manufacturing companies which are placed at Tirupur. He also had customers who would redesign the procured products and then sell them to the wholesalers/retailers. The business runs in cash and no credits are encouraged. Brokers are being involved and they work as middlemen between the stockiest and the wholesaler/retailer and get paid in the form of commissions. The stockiest is a taxpayer and his warehouse is a Goods and Service Tax registered firm. The goods once sold are not being accepted whereas goods can be exchanged with a new set of goods but this applies only with the regular customers. He makes a point that not all the roadside shops sell defective pieces, they sell unfamiliar branded pieces. The stockiest calls attention to the Kadarpet market where there is a wide variety of products found which would suit every need of the customer. He articulates that this is the business that runs on the principle of "low investment, high returns". He also states that these secondary markets are the place where an ample number of employment opportunities are being generated.

Interviewing a secondary market stockiest Mr. Mohammed Arham, it was astonishing to know that there were around 10,000 to 20,000 companies in Tirupur who were regular garment (rejected/surplus pieces) suppliers to the secondary market like Kadarpet. Therefore, he stated that the retailers had a wide variety of suppliers to choose from. Few retailers will be regular customers for a specific garment manufacturing company. Predominantly, these secondary markets receive products that were rejected by quality control, surplus production of garments, order cancellations, delayed orders, stock clearance, etc. Since shopping had become a hobby these days, these markets

Kadarpet's Secondary Market Supply Chain Flow Chart



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2.4 Objectives

- To understand the functioning of reverse supply chain and its contribution to the growth of the secondary market in the garment business.
- To find out the supply chain practices followed in the retail garment business.
- To propose, validate, and test a suitable model to find the impact of supply chain practices on the performance of the business.

3 Methodology

The research design is conclusive in nature. The sampling frame consisted of firms in the secondary market supply chain and distribution network. This research intends to prove that the best supply chain practices followed in the secondary market helps to improve the supply chain flow efficiency and velocity of the firm which in turn helps to have better supply chain performance, better supply chain performance helps in achieving the overall business performance. A cluster sampling method was incorporated. Owners of garment manufacturing companies, dealers for secondary market and agents were selected as the target respondents for this research as their involvement decides the functioning of the supply chain to the secondary market. A structured questionnaire was developed, purified and administered to the target respondent group for primary data collection. A pilot study was conducted on the respondents to test the reliability of the instrument for use in a large-scale data collection. A reliability of 0.7 (Cronbach alpha) demonstrates sufficient instrument reliability for data collection (Nunally 1978). The Cronbach alpha value for the constructs were greater than 0.7 which is sufficiently reliable. The instrument was administered to a total of 500 respondents out of which 250 were garment manufactures, 150 were dealers and 100 were commission agents. Sample size adequacy calculation makes use of many thumb rues. However, the most prudent way to determine a sample size adequacy will be to make use of power analysis. For this purpose, G* power 3 software is used. A post hoc sample size calculation for PLS Path modelling makes use of four constants – effect size, significance level, power of the test and number of predictors. The effect size is a measure of the strength of the effects being studied in the research. According to Cohen (1978) the value of effect size is 0.02 for small effects, 0.15 for medium effects and 0.35 for large effects. Most researches usually study the largest relationships between constructs. The significance level is also known as type I error. It is the probability of rejecting a correct hypothesis. The commonly used value for α is 0.05. The power of a test (1- β) is the probability of not accepting wrong hypothesis. The usually accepted minimum value of (1- β) is 0.8. Any lower values will indicate a test that is not powerful enough. The number of predictors is the number of indicators contained in the most complex construct in the proposed path model. These four

constants are fed into the software to analyze the deviation of R squared value from zero. The resultant output contains the required sample size satisfying the input conditions along with the actual testing power of the sample size. A post hoc calculation after the purification of the constructs is conducted to yield the net power of the sample being studied.

F tests - Multiple Regression: Omnibus (R² deviation from zero)

Analysis: Post hoc: Compute achieved power

Input: Effect size f ²	=	0.03
α err prob	=	0.05
Total sample size	=	500
Number of predictors	=	5
Output: Noncentrality parameter λ	=	15.000000
Critical F	=	2.232261
Numerator df	=	5
Denominator df	=	494
Power (1- β err prob)	=	0.862113

The effect size shows the precision of the sample size for the research (Figure 1). Since the research is in the area of social science, the effect size is fixed at a 0.03 which is a medium level. The α value describes the significance level and is at 5 percent level of significance. Using the combination of responses from 500 respondent and 5 independent constructs, we obtain the power of the test as 0.86. This clearly indicates that the theory will be true 86 percent of the time and the sample size of 500 respondents is sufficient to prove this theory.

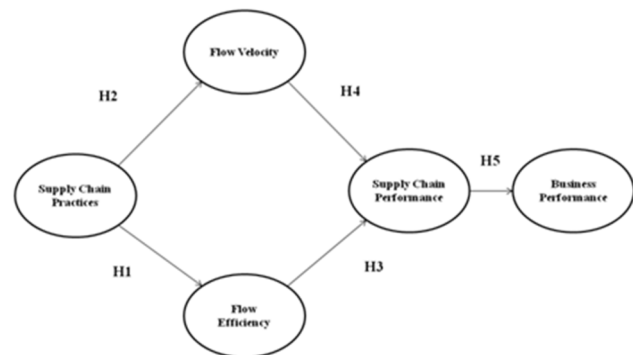


Figure 1 Conceptual model

4 Empirical data and results

4.1 Constructs to examine the efficiency of secondary supply chain

4.1.1 Supply chain management practices

Donlon (1996) portrays the most recent advancement of SCMP, which incorporates provider association, re-appropriating, process duration pressure, and nonstop procedure stream, and IT sharing. With more noteworthy client esteem and upper hand being the superseding goals of supply chain management (Wisner, 2003), it is battled that coordinated SCMP of the firm, for example, key

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collusions or formal provider advancement systems, data sharing (IS), data quality (IQ), can affect relative serious quality. Few supply chain management practices were considered for the study namely strategic supplier partnership (SSP), customer relationship, Information Quality, Information Sharing, Lean Retailing Strategies, and Postponement (Gawankar et al., 2013).

4.1.2 Flow velocity

Supply chain velocity is up tied with the adverse speed of response of the supply chain to face the market changes. Supply chain velocity is especially required in the event of disruption for response and recovery. Chris Clark (2007) had proposed the top five tips for accelerating supply chain velocity, namely: scrutinize sourcing activities, continuously improve your systems, increase fulfillment flexibility and reduce cycle times, replace inventory with date, seek out smaller or niche vendors.

4.1.3 Flow efficiency

Goedhals-Gerber, L. (2016) had identified 12 major factors which influence the supply chain efficiency in South Africa, by conducting personal interviews with the field experts for measuring three parameters across a supply chain, namely: reliability, speed, and cost. Similarly in this study, Leila Louise, Goedhals-Gerber (2010) had identified few constructs for measuring service attribute which in-turn help in the flow of efficiency as quicker information flow, real-time information on demand, better planning of procurement, manufacturing, and sale, crating partner relations in a supply chain and better operational factors.

4.1.4 Supply chain performance

Curiosity over performance measurement and management had prominently gained importance over the last 20 years (Taticchi and Balachandran, 2008; Gopal and Thakkar, 2012). The constructs which were considered for the study were Supply Chain Flexibility, Supply Chain Integration, Responsiveness to Customers, Product Innovation, Partnership Quality and Supplier performance (Shradha Ashok Gawankar, Sachin Kamble, and RakeshRaut, 2017).

4.1.5 Business performance

Business performance is a lot of execution the executives and expository procedures that empower the administration of an organization's presentation to accomplish at least one pre-chosen objectives. (Thilini R. Ariyachandra, Frolick, Mark N.,(2006)). A business performance management, observing project three essential exercises — a determination of objectives, combination, and mediation screens a unique framework with questions and requires cautious usage to effectively create business effectiveness.

5 Results and discussion

5.1 Hypothesis testing

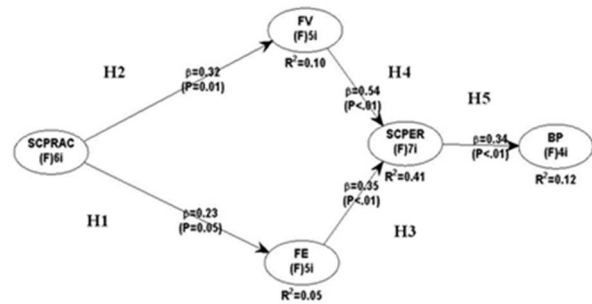


Figure 2 Hypothesis testing

Table 1 Relationship between the independent variable and dependent variable of Primary Market's Reverse Supply Chain

Hypotheses	P-value	Beta	R ²
Hypothesis 1(SC Practices*Flow Efficiency)	0.05	0.023	0.05
Hypothesis 2(SC Practices *Flow Velocity)	0.01	0.032	0.10
Hypothesis 3(Flow Efficiency*Supply Chain Performance)	<0.01	0.35	0.41
Hypothesis 4(Flow Velocity* Supply Chain Performance)	<0.01	0.054	0.41
Hypothesis 5(Supply Chain Performance* Business Performance)	<0.01	0.34	0.12

H1: Better supply chain practices in the secondary market leads to better flow efficiency.

From the above table (Table 1), it's evident that just supply chain practices don't lead to better flow efficiency. The significance value is 0.05 which proves the proposed hypothesis doesn't satisfy the condition. Hence, it's understood that many other factors are being included in achieving efficiency in a supply chain.

H2: Better supply chain practices in the secondary market leads to better flow velocity.

From the above table (Table 1), it's evident that better supply chain practices lead to better flow velocity. The significance value is 0.01 which is less than 0.05 proves the proposed hypothesis.

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H3: Better supply chain flow efficiency in the secondary market leads to better supply chain performance.

From the above table (Table 1), it's evident that better supply chain flow efficiency leads to better supply chain performance. The significance value being <0.01 which is less than 0.05 proves the proposed hypothesis.

H4: Better supply chain flow velocity in the secondary market leads to better supply chain performance.

From the above table (Table 1), it's evident that better supply chain flow velocity leads to better supply chain performance. The significance value is <0.01 which is less than 0.05 proves the proposed hypothesis.

H5: Better supply chain performance in the secondary market leads to better business performance.

From the above table (Table 1), it's evident that better supply chain performance leads to better business performance. The significance value is <0.01 which is less than 0.05 proves the proposed hypothesis.

6 Conclusion

This study has contributed in understanding the various dimensions of best supply chain practices and its effect on the flow velocity and flow efficiency of the money, material, and information in the secondary market garment supply chain. The firms operating under these uncertain circumstances in the secondary supply line have adopted practices which lead to appropriate velocity and efficient flow of money, material and information which has been proved through the testing of the model. The velocity and efficiency in the supply line has improved the performance thereby ensuring a more sustainable business for the firm operating in the secondary markets. An assessment of the results of the study has opened a window to the operations of the secondary garment supply chain line in the Indian cloth market which have been more or less camouflaged under the primary market operations. The outcome of the research also shows that these secondary market players have evolved their own strategies to sustain in volatile and uncertain circumstances. These strategies have proved to be very effective in minimizing wastage and increasing profitability of the manufacturing firms. This research looked very closely into the functioning of the secondary market supply line in few recognized cities and towns like Tirupur, Bargur and Chickpet. There are other locations where this study could have been extended to get a very broad perspective on the strategies adopted by these firms. This study could also be extended to focus on the risk mitigation techniques, sustainability practices and technology adaptability pertaining to the secondary market. The growth of the secondary markets has contributed immensely to the socio-economic fabric of the

nation. This research is helpful for academicians and researchers to conceptualize and frame new models to understand supply chain in the present scenario. The paper also aims to help the apparel sector to understand and efficiently develop and run their supply chain. The paper aims to give insights to government policy makers to alter and frame tax laws and other incentive schemes to encourage the growth of the secondary market.

References

- [1] ABDULKADER, M., BHATT, S.K., EL-MEKKAWY, T.: Reverse supply chain: Literature review and models, *Journal of Supply Chain Management Systems*, Vol. 4, No. 1, pp. 82-87, 2015.
- [2] ABERNATHY, F.H., DUNLOP, J.T., HAMMOND, J.H., WEIL, D.: *A stitch in time: Lean retailing and the transformation of manufacturing--lessons from the apparel and textile industries*, Oxford University Press, 1999.
- [3] WILSON, A.M.: Understanding organizational culture and the implications for corporate marketing, *European Journal of Marketing*, Vol. 35, No. 3/4, pp. 353-367, 2001.
- [4] CHATTOPADHYAY, S., SEN, S.: Changing Efficiency Profile of Organized and Unorganized Segments of Indian Garment Producing Units: A Comparative Analysis in the Post-MFA Period, *Journal of Supply Chain Management Systems*, Vol. 7, No. 1, pp. 9-24, 2018.
- [5] CHAUDHRY, H., HODGE, G.: Postponement and supply chain structure: cases from the textile and apparel industry, *Journal of Fashion Marketing and Management: An International Journal*, Vol. 16, No. 1, pp. 64-80, 2012.
- [6] CLARK, C.: Getting back to basics: Top five tips for accelerating supply chain velocity, *Supply & Demand Chain Executive*, Vol. 2007, No. July, 2007.
- [7] CRONBACH L.J.: Coefficient Alpha and Internal Structure of Tests, *Psychometrika*, Vol. 16, No. 3, pp. 297-334, 1951.
- [8] DEFEE, C.C., STANK, T.P., ESPER, T.L., MENTZER, J.T.: The role of followers in supply chains, *Journal of Business Logistics*, Vol. 30, No. 2, pp. 65-84, 2009.
- [9] DEKKER, H.C.: Value chain analysis in interfirm relationships: a field study, *Management accounting research*, Vol. 14, No. 1, pp. 1-23, 2003.
- [10] DOGANATA, Y.N., DRISSI, Y., FIN, T.H., JENG, J.J., KIM, M.J., KOZAKOV, L.: U.S. Patent No. 7,089,250. Washington, DC: U.S. Patent and Trademark Office, 2006.
- [11] DOMINGUES, M.D.S., GUIDINI, J., DAROLD, R.: Tecnologia da informação: novas possibilidades para o treinamento e desenvolvimento nas empresas, *Revista de Negócios, Blumenau*, Vol. 1, No. 4, pp. 7-11, 1996. (Original in Portuguese)

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- [12] DONLON, J.P.: Maximizing value in the supply chain, *Chief Executive*, Vol. 117, No. 1, pp. 54-63, 1996.
- [13] FLEISCHMANN, M., KRIKKE, H.R., DEKKER, R., FLAPPER, S.D.P.: A characterisation of logistics networks for product recovery, *Omega*, Vol. 28, No. 6, pp. 653-666, 2000.
- [14] FROLICK, M.N., ARIYACHANDRA, T.R.: Business performance management: One truth, *IS Management*, Vol. 23, No. 1, pp. 41-48, 2006.
- [15] GAWANKAR, S.A., KAMBLE, S., RAUT, R.: An investigation of the relationship between supply chain management practices (SCMP) on supply chain performance measurement (SCPM) of Indian retail chain using SEM, *Benchmarking: An International Journal*, Vol. 24, No. 1, pp. 257-295, 2017.
- [16] GAWANKAR, S., KAMBLE, S.S., VERMA, R.: Effect of supply chain management practices on supply chain profitability: an empirical investigation using structural equation modelling in Indian retail sector, *International Journal of Services and Operations Management*, Vol. 16, No. 2, pp. 145-173, 2013.
- [17] GOEDHALS-GERBER, L.L.: *The measurement of supply chain efficiency: Theoretical considerations and practical criteria*, Doctoral dissertation, Stellenbosch: University of Stellenbosch, 2010.
- [18] GOEDHALS-GERBER, L.L.: The composite supply chain efficiency model: A case study of the Sishen-Saldanha supply chain, *Journal of Transport and Supply Chain Management*, Vol. 10, No. 1, pp. 1-13, 2016.
- [19] GOLDRATT, E.M.: *An Introduction to Theory of Constraints: The Production Approach*, Workshop Description, Avraham Y. Goldratt Institute, 1992.
- [20] GOPAL, P.R.C., THAKKAR, J.: A review on supply chain performance measures and metrics: 2000-2011, *International journal of productivity and performance management*, Vol. 61, No. 5, pp. 518-547, 2012.
- [21] GUIDE JR, V.D.R., VAN WASSENHOVE, L.N.: OR FORUM—The evolution of closed-loop supply chain research, *Operations research*, Vol. 57, No. 1, pp. 10-18, 2009.
- [22] HANDFIELD, R.B., BECHTEL, C.: The role of trust and relationship structure in improving supply chain responsiveness, *Industrial marketing management*, Vol. 31, No. 4, pp. 367-382, 2002.
- [23] HAU, H., REY, H.: Can portfolio rebalancing explain the dynamics of equity returns, equity flows, and exchange rates?, *American Economic Review*, Vol. 94, No. 2, pp. 126-133, 2004.
- [24] ThredUp, Resale Report, [Online], Available: <https://www.thredup.com/resale/#resale-growth> [28 Aug 2021], 2021.
- [25] MARTINKO, K.: Secondhand Clothing Market Is Growing Faster Than Apparel Retail, Treehugger, [Online], Available: <https://www.treehugger.com/se-condhand-clothing-market-has-grown-x-faster-apparel-retail-past-years-4858391> [28 Aug 2021], 2019.
- [26] KUMARI, A.: *Integrating sustainability into strategic sourcing and supplier selection process: a focus on the Indian textile industry*, Politecnico Milano 1863, Diploma Thesis. 2018.
- [27] KWOK, S.K., WU, K.K.: RFID-based intra-supply chain in textile industry, *Industrial Management & Data Systems*, Vol. 109, No. 9, pp. 1166-1178, 2009.
- [28] LAMBERT, D.M., COOPER, M.C., PAGH, J.D.: Supply chain management: implementation issues and research opportunities, *The international journal of logistics management*, Vol. 9, No. 2, pp. 1-20, 1998.
- [29] LEE, H.L., SASSER, M.M.: Product universality and design for supply chain management, *Production Planning & Control*, Vol. 6, No. 3, pp. 270-277, 1995.
- [30] LEE, H.L., FEITZINGER, E., BILLINGTON, C.: Getting ahead of your competition through design for mass customization, *Target*, Vol. 13, No. 2, pp. 8-17, 1997.
- [31] LI, X., OLORUNNIWO, F.: An exploration of reverse logistics practices in three companies, *Supply Chain Management: An International Journal*, Vol. 13, No. 5, pp. 381-386, 2008.
- [32] MAHOUR, L. N., MANJUNATHA, M., CHOUDHARY, H. K., KUMAR, R., ANUPAMA, A. V., DAMLE, R., ... & SAHOO, B. (2019). Structural and magnetic properties of Al-doped yttrium iron garnet ceramics: ⁵⁷Fe internal field NMR and Mössbauer spectroscopy study, *Journal of Alloys and Compounds*, Vol. 773, No. January, pp. 612-622, 2019.
- [33] MINNER, S.: Multiple-supplier inventory models in supply chain management: A review, *International Journal of Production Economics*, Vol. 81, pp. 265-279, 2003.
- [34] NUNNALLY J.C.: *Psychometric Theory*, McCraw-Hill, New York, NY., 1978.
- [35] PRAHINSKI, C., KOCABASOGLU, C.: Empirical research opportunities in reverse supply chains, *Omega*, Vol. 34, No. 6, pp. 519-532, 2006.
- [36] ROGERS, D.S., TIBBEN-LEMBKE, R.: An examination of reverse logistics practices, *Journal of business logistics*, Vol. 22, No. 2, pp. 129-148, 2001.
- [37] SELNES, F., SALLIS, J.: Promoting relationship learning, *Journal of marketing*, Vol. 67, No. 3, pp. 80-95, 2003.
- [38] SHARMA, V., GIRI, S., RAI, S.S.: Supply chain management of rice in India: a rice processing company's perspective, *International Journal of Managing Value and Supply Chains*, Vol. 4, No. 1, 25-36, 2013.

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- [39] TAN, K.C., KANNAN, V.R., HANDFIELD, R.B.: Supply chain management: supplier performance and firm performance, *Journal of Supply Chain Management*, Vol. 34, No. 3, pp. 2-23, 1998.
- [40] TATICCHI, P., BALACHANDRAN, K.R.: Forward performance measurement and management integrated frameworks, *International Journal of Accounting and Information Management*, Vol. 16, No. 2, pp. 140-154, 2008.
- [41] TAYLOR, J.R.: *Linguistic categorization*, Oxford University Press, 2003.
- [42] ÜLGEN, V.S., FORSLUND, H.: Logistics performance management in textiles supply chains: best-practice and barriers, *International Journal of Productivity and Performance Management*, Vol. 64, No. 1, pp. 52-75, 2015.
- [43] VARUKOLU, V., PARK-POAPS, H.: Technology adoption by apparel manufacturers in Tirupur town, India, *Journal of Fashion Marketing and Management: An International Journal*, Vol. 13, No. 2, pp. 201-214, 2009.
- [44] WISNER, J.D.: A structural equation model of supply chain management strategies and firm performance, *Journal of Business logistics*, Vol. 24, No. 1, pp. 1-26, 2003.

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