

A Research Concerns the Determinants of Supply Chain Performance among SME's in Tirupur Textile Cluster

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Abstract

The research delves at length into the determinants of supply chain performance among the SMEs in the Tirupur textile cluster, especially the garment segment. It was important to identify knowledgeable respondents who could truly depict the research situation and support the research. This does not purport to influence the study as the population members would intuitively apply the concepts and principles of cluster theory and supply chain management. In the present study, the researcher adopted a cross-sectional research design to provide a 'snap-shot' of whether the adoption of a supply chain enhances the performance of the company. The conclusions and considerations of the study deal with how the determinants in this study of supply chain performance in an industry cluster have contributed to supply chain performance. The very fact that a combination of sorts is attempted, including internal facing and external (customer) facing dimensions, for sure will pave way for further research on these lines. The limited number of articles about this specific aspect that have been found in the literature review underlines the originality of the discussion proposed here and suggests that further research is needed to expand the empirical results to a broader spectrum of issues.

Keywords: Supply Chain Performance, Determinants, Textile cluster, SMEs

Introduction

Industrial clusters have been patronized over the decades as they contribute to the economic performance of the region. In other words, these are a geographical agglomeration of firms that contribute to the immediate society by way of employment generation, development of infrastructure, and so on, and other stakeholders like the government through export earnings. Many a time industrial clusters could be primarily formed due to factor input advantage or demand conditions or simply by a chance factor because of an early initiative. Supply chain management strategies are firm-specific across a network of organizations to achieve competitive advantage. Incidentally, a firm's supply chain network could be able to achieve the benefits of a cluster approach. Industrial cluster is an economic phenomenon, and the current industrial clusters mainly apply the theory related to industrial economics to research

classification of industrial clusters, formation mechanism, innovation networks, competitive advantages, and so on, attaching much more importance to the macro level, strategic, qualitative study, and application. Supply chain management is an analytical tool that uses the combined knowledge of operational research, mathematics, economics, and information discipline to do the qualitative and quantitative analysis of personnel, financial, goods, and information flow problems in enterprise management. It is a management tool aimed to reduce cost, paying attention to micro-operation, operation management, and quantitative studies and application. The concept of the supply chain has different connotations at different times, and different scholars have different views. Domestic and foreign researchers in related fields give points of view on the supply chain from different perspectives. However, an official study of the supply chain issue is generally believed to date back to 1940-60. We can easily infer that the early understanding of the supply chain was confined to the production process within manufacturing enterprises. As the evolution of supply chain management took place, more and more focus given to the external business factors and the external environment. Balancing the internal processes to meet the external demands and influence became critical for improving the performance of the supply chain.

Some of the factors that resulted in the benefits of externalities for firms within them are technology availability, access to skilled labour, access to inputs, and marketing advantages. These externalities provided a competitive advantage both domestically and internationally. Firms located in industrial clusters are highly competitive in the neoclassical sense, and they do not offer much product differentiation. The major advantages of industrial clusters arise from the simple propinquity of firms, which allows easier recruitment of skilled labour and rapid exchanges of commercial and technical information through informal methods. They exhibit efficient and competitive capitalism and minimal transaction costs under conditions of the limited scale of the economy.

Review of Literature

The successes achieved by organisations that implement the strategic supply chain management approach will certainly have a positive impact on the popularity of the approach and a trend towards implementing the supply chain management approach by increasingly more organizations is to be expected. This trend will undoubtedly influence small and medium-sized businesses (SMEs)

Christiaanse and Kumar (2000) are of the opinion that in order to compete successfully, a supply chain needs to be responsive to the customer's demands, and provide mass individualized products or services at the lowest cost and response time at an acceptable level of quality. Supply chains are a series of linked suppliers and customers - every customer is in turn a supplier to the next downstream organization until a finished product reaches the ultimate end user. There is a need to work on the facets of efficient and responsive supply chains.

Management of the supply chain has evolved over the last two decades from an emphasis on integrating logistics and lowering costs to providing better products and services to customers, quickly and cheaply. Supply chain management is a dynamic enabler for organisations to realise the challenge of getting products to consumers when, where how and in the quantity required in a cost-effective manner

A global supply chain network is central to the operational strategy of any company and therefore effective supply chain management has been recognized to have a significant impact on overall business performance. Traditionally, the supply chain has been efficiency-driven, aiming to pass the product through the chain in the shortest time with the lowest cost. Effectiveness and competitive advantage are now at the centre of many supply chain improvement initiatives. Managing their supply chain helps companies achieve a variety of benefits, including reduced transaction costs, improved customer service and increased customer retention.

Alfred Marshall, the English economist, is supposed to have propounded the cluster concept in 1910. He examined the industrial districts found in Europe and explained that the main reasons for the localization of industry are physical conditions such as climate and availability of raw materials. These factors resulted in benefits of externalities for firms within them such as technology availability, access to skilled labour, access to inputs and marketing advantages. These externalities provided a competitive advantage both domestically and internationally. Firms located in industrial districts are highly competitive in the neoclassical sense, and in many cases, there is little product differentiation. The major advantages of industrial clusters arise from the simple propinquity of firms, which allows easier recruitment of skilled labour and rapid exchanges of commercial and technical information through informal channels.

"Clusters are a geographically proximate group of interconnected companies and associated institutions in a particular field linked by commonalities and complementarities. Clusters encompass an array of linked industries and other entities important to competition ... including governmental and other institutions - such as universities, standard setting agencies, think tanks, vocational training providers and trade associations" Porter (1998).

Objectives of the Study

- To analyse the trends at the macro level on exports from India, manufactured products exports, textile, and textile products export performance and then relate to performance at the industry level of the apparel manufacturing units at Tirupur.
- To analyse the supply chain performance of units located at Tirupur based on their perceptions. Supply chain performance would be based on delivery performance, supply chain responsiveness, production flexibility, margin representing cost efficiency and asset utilisation. Ideally observed data along with their perceptions measured on a scale are gathered and chosen as a reliable method for analysing SMEs.
- To explain in their perception critical factors like customer (buyer) relationship; quality initiatives; management commitment to Safety, Health, and Environment; business focus and labour diversity which influence supply chain performance.
- To analyse if there is any significant variation when it comes to measuring the Supply Chain Performance between the export-oriented units and non-export-oriented units

Methodology

A descriptive research design is followed in this study because it describes data and characteristics of the population phenomenon being studied. Descriptive research answers the questions of who, what, where when and how. This research is used to find out the basic

reason or to identify the cause of something that is happening. Macro analysis is done using data from published sources (RBI / SIDBI/ Government of India and so on) to study the performance of exports and more specifically on readymade garments and that of Tirupur units at the industry level. To capture trends, a period of fifteen years is chosen from 1995-96 to 2010 - 11. The terminal period was chosen as the year where the latest information is available. Incidentally, it also covers recovery from the global meltdown in the years 2008- 09. The beginning year 1995-96 captures reasonably the beginning of the liberalisation era which was from 1991-92. But there would be a lag and performance could take three years to get reflected. The effect of any structural adjustments in policies at the government level will take time to reach the grass root and also get stabilised. Hence, the years 1995-96 would well reflect the requirement for the study.

Results

Cost focus and responsiveness to demand by businesses in the supply chain will eventually bring about a rise in the overall level of profits and competitive capabilities. In short, the intrinsic relationship between the supply chain and industry cluster makes it possible for both of them to co-exist in a symbiotic way and seek common development. This relationship solves such issues as insufficient resources existing in the operations of traditional enterprises and the development of regional economy, as well as paradoxes between dispersed operation and diversity from market demands. Therefore, we should make full use of the intrinsic relationship between the supply chain and industry cluster to make integration so as to boost industrial competitiveness, thereby making it pave the way for economic development and stepping up the competitiveness of the regional economy.

Business decisions, actions and ultimate impacts are influenced by:

1. corporate social responsibility focuses on the rewards that companies can realise by understanding the dynamic and constantly changing stakeholder expectations and investing in better management of their social and environmental impacts.
2. the role of the local economic environment in terms of firms trading and competing together to strengthen the ability of individual firms to thrive in an industrial cluster.
3. the health of the macroeconomic environment, the quality of public institutions and the ability of firms to innovate and adopt new technologies.

Each of these above areas have identified and examined an empirical phenomenon that has emerged organically and tried to understand the factors that drive or constrain its development. To go further and actively design and implement tools, strategies, and policies to foster more competitiveness as well as greater collaboration with SME clusters, in order to overcome obstacles to business-driven development. Tirupur has grown considerably over years, and it would immensely benefit researchers and supply chain professionals to look into the causative factors that gave the impetus - could be the adoption and consequent benefits of industrial cluster approach or the entrepreneurial spirit that the SMEs in Tirupur seem to inherit somehow or the strong supply chain orientation among the supply chain networks. According to industry experts, "the Tirupur industry has the ability to take up orders at short notice". The industry is also able to produce the entire range of knitwear at low cost and good quality. The occasional delays in delivery, the inability of many firms to match the quality standards demanded at

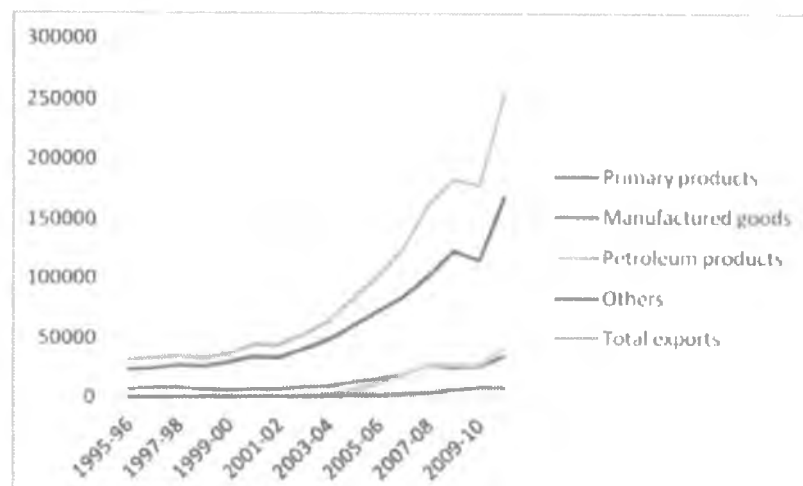
higher price points and the inability of the industry at the lower end of the market to compete with the Chinese and exports from Bangladesh and Sri Lanka are some of the weaknesses. It may not be possible to precisely how much each of these factors contributed to the economic performance of firms in Tirupur, but it is essential to understand how strong the perceptions of the SMEs are in internalising the significance of supply chain orientation and its benefits. If the perception level is inadequate, then one can very well advocate how this can be improved upon. It is this background on which this study has embarked on interacting with different stakeholders in the supply chain network. A lot of research has been happening exclusively on SMEs or clusters on their supply chain performance using either 'financial or non-financial metrics though a few efforts can be traced to efforts looking at SME clusters with a focus on both 'financial and non-financial -multidimensional performance measures. This research on "Determinants of Supply Chain Performance among SMEs in Tirupur Textile Cluster" aims at combining SMEs and cluster concepts and at evolving a composite performance measurement tool that can be dynamic in nature giving flexibility in the choices and combination of parameters to be measured depending on the business environment.

Discussions

India's exports

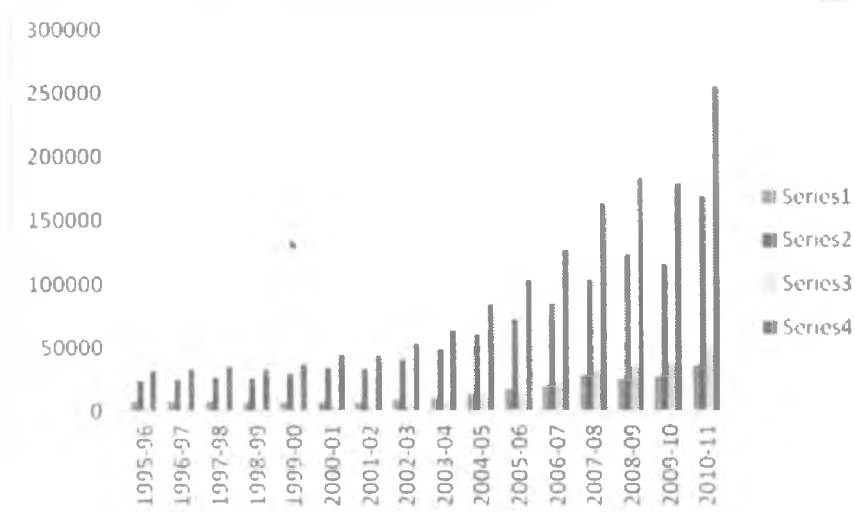
From 1995-96, it may be noticed from the following pages that sector-wise exports from India, total exports have grown at a compound annual growth rate (CAGR) of 15 per cent. Total exports are contributed by four groups' namely primary products, manufactured products, petroleum products and others.

Figure 1: Sector-wise Exports Data - a Graph



Primary products and manufactured products' Exports performance:

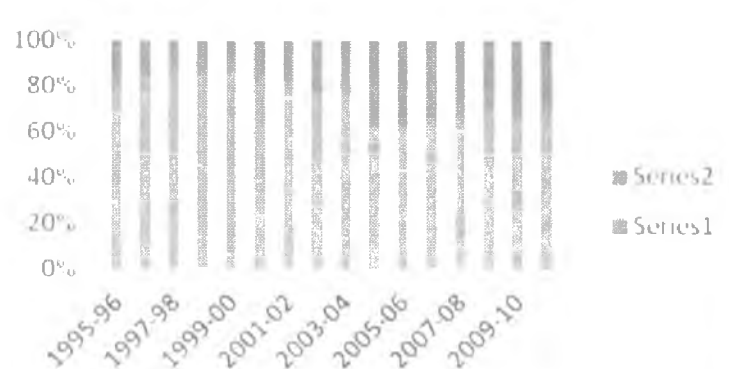
Figure 2: Growth of Exports



Primary Products:

1. Primary products consist of agriculture and allied products exports and that of Ores and minerals.
2. Agriculture and allied products grew at a CAGR of 10 per cent. Alternatively, minerals and ores grew at a CAGR of 16 per cent influencing the total primary products exports to 11 per cent.
3. The share of ores and minerals which was around 15 per cent of total primary products went up to 30 per cent of the share in total primary products exports.
4. This is because of the spurt in ores and minerals exports from 2004 -05 mainly because of the booming Chinese market.

Figure 3: Growth of Export of Primary Products

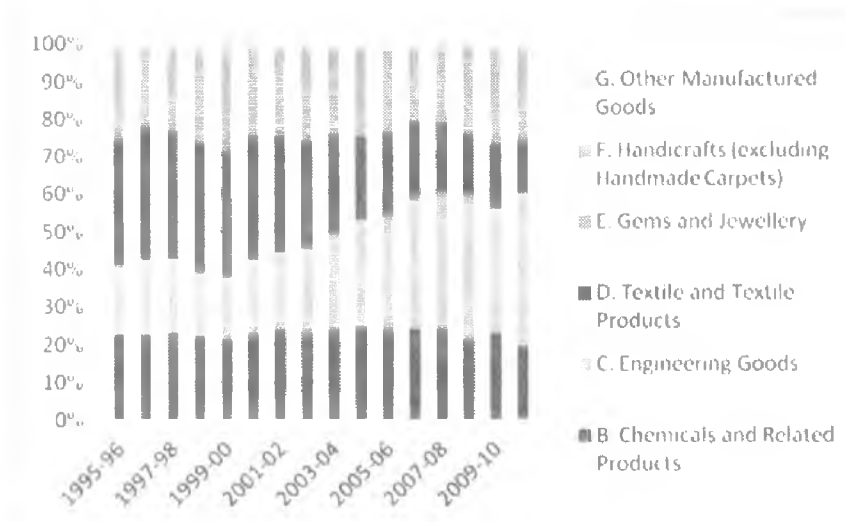


Manufactured Products

1. It may be observed that the manufactured goods exports have gone up by 14 per cent. This consists of a. leather and manufactures, b. Chemical and related products, c. Engineering goods, d. Textile and textile products, e. Gems and Jewellery, f. Handicrafts and g. Other manufactured goods.
2. As it may be observed that each of the industry had a varying share on total manufactured goods exports and structure of manufactured goods exports changed over the years which reflect on the economy.
3. Leather and manufactures which were at US \$ 1752.2 million in 1995-96 has gone up to US \$ 3789.3 million at a CAGR of 5.3 per cent which is lower than the total manufactured products exports growth. This is impacting on its share on total manufactured goods exports which was at 7 per cent in the year 1995-96 has come down to 2 per cent.
4. Chemicals which were at US \$3597 million in 1995-96 has gone up to US \$28979.6 million at a CAGR of 14.9 per cent which is almost at the same rate of growth of the total manufactured products exports. This is impacting on its share on total manufactured goods exports which was at 15 per cent in the year 1995-96 has gone up to 17 per cent. One can conclude that the chemicals has retained and improved marginally its share of exports.
5. Engineering goods which were at US \$ 4391 million in 1995-96 has gone up to US \$ 68784.1 million at a CAGR of 20%. 1 per cent which is much higher than the total manufactured products exports growth. This is impacting on its share on total manufactured goods exports which was at 18 per cent in the year 1995-96 has gone up to 41 per cent. One can conclude that the engineering goods are the prime driver of manufactured goods exports in India
6. Textiles and textile products which were at US \$ 8031.6 million in 1995-96 has gone up to US \$ 23312.2 million at a CAGR of 7.4 per cent which is lower than the total manufactured products exports growth. This is impacting on its share on total manufactured goods exports which was at 34 per cent in the year 1995-96 has gone down to 14 per cent. One can conclude that the textile and textile products exports could not be maintaining its share in exports may be due to production constraints which include supply side factors and demand for exports in India. The further discussion on next level component of exports analysis may throw some more light on this
7. Gems and jewellery which were at US \$ 5274.8 million in 1995-96 has gone up to US \$ 40790.7 million at a CAGR of 14.6 per cent which is almost same as the total manufactured products exports growth. This is impacting on its share on total manufactured goods exports which was at 22 per cent in the year 1995-96 has become to 24 per cent. One can conclude that the gems and jewellery exports could maintain its share in exports may be due to managing its economies reflecting on overall trend and it has substantial share in total exports.
8. It may be noted that handicrafts were affected badly, and its share declined and the other manufactured goods were more in line with total manufactured goods exports and its share is insignificant at 1 per cent of total manufactured goods exports.
9. Thus, here we conclude that engineering goods led the manufactured goods exports, gems

and jewellery and chemicals broadly followed the trend whereas the others including textiles and textile products share and growth came down.

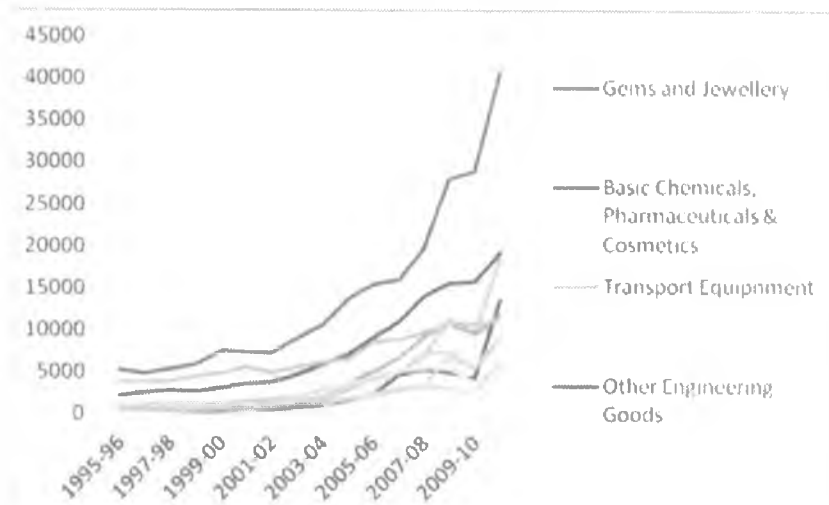
Figure 4: Growth of Exports of Manufactured Products



Top 10 Products Exports Performance

1. Analysis of top 10 products exports is discussed hereafter excluding petroleum and its products group.
2. Top 10 product group exports were US \$ 16162.8 million in 1995 -96 went up to the US \$ 146033.5 million in 2010-11 which had a CAGR of about 16 per cent.
3. Top 10 products group of exports constituted 57 per cent of total exports from India and 69 per cent of total exports excluding petroleum and petroleum products. This leads to the inference that these 10 products play a major exports performance of India.
4. These items include in the descending order of rank as below: Gems and jewellery; Basic chemicals (1), Pharmaceuticals and Cosmetics (2); Transport equipment (3); Other Engineering goods (4), Machinery and Instruments (5); Readymade garments (6), Manufacture of metals (7); Electronic goods (8); Iron & Steel (9) and Other Ores and Minerals (10).
5. It may be expected that except Other Ores and Minerals which is of primary products category, all others are manufactured goods.
6. From manufactured goods, except readymade garments rest of the products are from groups which were growing at least at the overall growth rate of exports and above
7. Also, one may note that Gems and Jewellery have been growing at a much higher rate in the last three years while transport and other engineering goods have had a spurt in exports in the last year immediately after global meltdown in 2008 -09

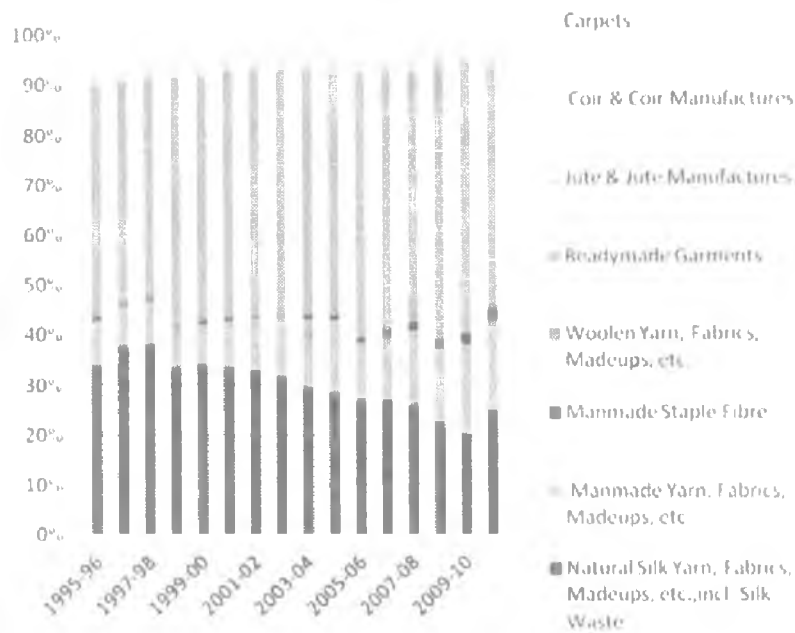
Figure 5: Top 10 Export items



Export of Textile and Textile Products in India

1. It may be observed from the table below that Readymade garments, Cotton Yarn, Fabrics, Made-ups, etc and Manmade Yarn, Fabrics, Made-ups, etc constitute 48%, 23% and 18% share of total exports as of 2010 -11. These account for 89% among three out of the nine subgroups.
2. Though the overall growth rate is 7.4%, the manmade yarn group has registered a growth rate of 18%, readymade garments at 7.7% and cotton yarn at 5.1%.
3. The inference here could be that the readymade garments exports is the key influencer of the performance of Textile and textile products exports. Though manmade fibre is increasing, the decreasing growth rate of cotton yarn leads to probing questions. These may be that yarn may be converted into garments and reflected for growth of the segment. Alternatively, the production of cotton and conversion of yarn and its derivate may not be at a high growth rate.
4. The overall growth rate may have to improve, and the sector needs further impetus and constraints are probed during personal discussions and taken up later.

Figure 6: Export of Textiles and Textile Products



Determinants of Tirupur Cluster Performance

Tirupur is about 60 km away from industrial and well developed in terms of education, and infrastructure and is the second most important city in terms of economic activity in Tamil Nadu. While Coimbatore is well known for its strengths in engineering and textile, apart from other things, Tirupur has been placed on the knitwear map serving both domestic and predominantly global markets. In less than three decades, Tirupur export has grown up from less than Rs.10 Crores in 1984 to Rs.11,000 Crores in 2009-10. According to the official source (Tirupur district website), the first knitwear unit in Tirupur was set up in 1925. It emerged as the prominent centre for knitwear in South India by the 1940s. In 1942, 34 units were engaged in the production of knitwear all these units were composite mills and the production was carried out in the same unit. There are also references to some units performing specific tasks/operations like bleaching and dyeing, located in the larger units. By 1961, the number of units rose to 230 and till the early 1970s, the industry catered only to the domestic market. These units were mostly composite mills without any subcontracting system of production.

The export market began to expand in the 1980s and subsequently, Tirupur emerged as the largest exporter of cotton knitwear from the country, accounting for roughly 80 per cent of the total cotton knitwear exporters. Also, it led to a spurt in entrepreneurial spirits and a large number of units came into operation gaining the economic performance of the town. This is what Porter refers to as economic performance being led in a cluster for a number of reasons. Tirupur the cluster activity includes both horizontal and vertical businesses. There has been strong growth in process outsourcing and the development of support industries. There are exporters and manufacturers who mostly outsource each activity of garment making. These

include Knitting, Dyeing & Bleaching, Fabric Printing, Garmenting, Embroidery, Compacting and Calendaring and other related activities

Table 1: Types of Units

<i>Operations</i>	<i>No: of Units</i>
Knitting Units	1500
Dyeing and Bleaching	700
Fabric Printing	500
Garment Making	2500
Embroidery	250
Other Ancillary Units	500
Compacting and Calendaring	300
Total	6250

It may be seen from the above table that garment making is the main activity and others fold into the same. Though garment making may have complete value chain of activities in manufacture of garments, the component processes like knitting, dyeing, and bleaching, fabric printing are growing either because the larger player use them for augmenting capacity for order fulfilment or integrators who have a niche operation and completes order fulfilment by leveraging support process owners thereby keeping the focus and reducing risk. Export performance can be tracked by analysing performance over the years. Tirupur's direct exports started with Italy. Verona, a garment importer from Italy came to Tirupur in 1978 through Mumbai exporters to buy white T-shirts. A lot of job workers were manufacturing garments for merchant exporters. The potential was realised, and trade followed the suit. Quality was one of the drivers of exports. In 1981 European retail chain C&A came. Gradually, other stores approached the exporters. Tirupur Exports from Rs. 10 crores in 1985 to Rs.5000 crores in 2003, and Rs.11,000 Crores in 2009-10 which is a compound annual growth rate of above 40 per cent. One can be sure that very few industries and the economic region could have achieved such performance. Tirupur can be easily classified as an industrial cluster that typifies an organic relationship between firms, both horizontally and vertically. This is because of the dense network of production organizations that exists within the region. The production of garments in the cluster is segmented into separate modules and firms participate in different portions of the value chain. Everywhere in the small town one can easily notice how activities revolve around the production and sale of knitwear garments. There are a large number of suppliers selling different grades of yarn and these yarns are procured by producers to initiate the production process.

Tirupur has been the centre of the textile business since 1870. Today, it is the foremost garment cluster in India, providing employment to more than 3,00,000 people directly and indirectly. It contributes to a considerable amount of foreign exchange earnings for India with a share of more than 50% of cotton knitwear exports from India. This is mainly because of its continuous business growth and outstanding performance based upon self-initiatives without waiting for the Government support

In the Tamil Nadu garments industry, it is common to find large firms that have grown large 'horizontally, by splitting off production into many units under a single company.' Each unit can be registered as a small-scale unit. Small firms with 100- 200 machines are the most agile and able to handle both, small-batch orders, and large orders by subcontracting out portions of the job to smaller firms. "Larger firms have more trouble adjusting to global market shifts, [at least in garments]." (Apparel Export Promotion Council 2001). Therefore, the use of the distinction between small and larger enterprises often is not very clear in the Tirupur context. "Designation of the sector as small scale means that firms which are expanding simply register spatially, separate further units of production (despite common ownership), thus giving the somewhat distorted impression of an industry composed solely of small and medium-sized individual firms." The Tirupur industry has certain strengths like the ability to take up small orders at short notice. The industry is also able to produce the entire range of knitwear at low cost and reasonably good quality. However, among the weaknesses of the industry are the occasional delays in delivery, the inability of many firms to match the quality standards demanded at higher price points and the inability of the industry at the lower end of the market to compete with the Chinese and exports from Bangladesh and Sri Lanka.

It is perceived that among the major threats faced by the industry are the phase-out of quotas, non-tariff barriers on account of the environment and social issues like child labour and personal safety norms and the inability to reap benefits of economies of scale due to fragmented holding of the manufacturing capacity. Thus, Tirupur can be said to specialize in relatively low volumes, fashion-sensitive products but not high-value garments for niche markets. This is in line with India's overall export profile, concentrated on the cotton, semi-fashion middle price segment. The minimum scale for efficient production in India is much lower than for example in China or Bangladesh. The degree of subcontracting is much higher. The industry is highly dependent on agents and buying companies.

Individual suppliers who have been able to gain the confidence of their principals are no longer limiting themselves merely to what they produce themselves but are starting to trade in products which are made by other manufacturers. This trend is apparent in the case of goods for export as well as for the domestic market. One of the characteristics of the Tirupur garment industry is the volatility of the workforce. If a factory cannot provide work, workers will go to another. Workers also use their mobility to get whatever small increase in wages that another factory might offer. Workers may use changing companies to get higher grade jobs by giving false information about their previous job. As regards the market structure, the selected industry consists of a large number of small firms as the production of readymade garments are no longer reserved exclusively for the small-scale units. Consequently, most of the garment exports are in the non-branded bulk export segment where 'cost competitiveness' is as equally if not more important than product differentiation. With no entry or exit barriers, the market structure can, therefore, be taken to be competitive. Hence, considerations relating to imperfect competition and product differentiation are not relevant in gauging the competitive advantage at the firm level in this industry. Tirupur is also a well-known cluster for the export of cotton apparel and even international agencies are focusing on the development of this cluster. Hence one may look at it as a case study with a clear focus to gather perceptions of various stakeholders from production units and come up with recommendations which may be considered by policymakers. Most of garment producers or exporters are generally confined to stages such

as cutting, stitching, and finishing activities and get the prior stages done by specialized firms. The first stage can be termed fabrication or knitting. The kind of knitting required depends on the design of the garment, which also determines the appropriate machine to be used. Summer garments are usually fabricated by single jersey machines and winter garments by double jersey knitting machines. Then depending on the length of the fabric required and yarn counts applied, machines of different diameters and gauges are used. Hence, what is important is that a large variety of machines with various specifications should be available to produce various types of knitwear garments.

This requirement itself creates the possibility of a large array of subcontracting relationships between firms where garment producers outsource the knitting activity to different knitting units in order to get the fabric done according to the specific requirement. Also, the knitting units procure machines according to the demand for garments and cater to one or two specific knitting jobs. One can easily find how firms in Tirupur are keen to acquire modern machines mostly imported from Japan, Taiwan, Germany U.K., Italy, and Singapore. There are specialized jacquard machines for multicoloured embroidery and also for making specific designs for collars. The production organization in Tirupur includes a wide variety of subcontracting or outsourcing relationships between firms. However, it is quite different from the standard asymmetric relations assumed in parent-subcontracting relations or in putting out systems. True indeed, the exporters are dominant actors in the production process, but the nature of interdependence is a kind of mutual relation rather than acute dependence.

The job working, as it is often referred to, might be of three different types:

1. The production process is segmented in several parts such as knitting, dyeing, processing, printing and so on and then outsourced to units that specialize in such activities. This may be termed as outsourcing or out contracting in which case the exporter who coordinates the production process assigns specific jobs to relatively smaller specialized units.
2. The second version can be termed as 'in-contracting', which is separating parts of the production process-those performed by separate and dedicated sections of the same unit but run semi-autonomously by respective managers. This happens in larger where there is a fairly high level of integration. This is possibly another way of manoeuvring books of accounts in such a way as to show the sections of the same unit as independent SSI units and thus avail advantages there.
3. In some cases, the bigger firms integrate the production process for the sake of their control over production. But in such situations, the capacities created in different sections, especially knitting and processing may not be exhausted by the production of the firm alone. Hence the exporting firm besides doing jobs for their own garments works for others as job work in order to utilize the skills to their full potential.

The various mixtures of the above-mentioned arrangements provide a large amount of flexibility to both large and small firms. These arrangements work on the basis of mutual benefits between large and small firms and help develop an organic relationship within the firms in the cluster.

First, large firms can avoid large investments for integrated arrangements. In order to attain control over production in view of maintaining the strict time frames as well as stipulated

quality standards, it is not always necessary to depend on vertically integrated firms. Out contracting has evolved in such a way in Tirupur that it can easily deliver the advantages of integrated units. In most cases, the owners of job working units and those of the exporting firms belong to the same caste and kinship, which helps in building mutual trust. In addition, it is very difficult to build up capacities for different types of garments. This is only because the knitting section requires a large variety of machines to cater to different types of fabrics and as a result, a significant possibility of unutilized capacity remains. In any case, in garments, ideal capacity utilization is around 75 per cent and in the case of a fully integrated unit, it is very difficult to attain such capacity utilization in all operations in a uniform manner.

Second, for the smaller firms, the cost of entry to the industry declines because of the availability of subcontracting jobs. In many of the printing units and in some knitting units we found that the owners themselves or their parents were employed in garment units. An owner starts with job work and progresses to the level of a successful exporter in many of cases. On the other side, job workers are not linked to a single-parent firm rather they work for a number of exporters and dependency is not much exploitative as it generally happens to be when there are few buyers and a large number of sellers.

Finally, these relationships provide ample scope for flexibility in the production process and the cluster does not have to depend on rigid standardized production lines which are well suited for mass production. At the same time, it helps in managing a large number of workers in a decentralized manner and gets rid of the liabilities and responsibilities attached to large employment. Hence, in some sense, it also helps in reducing the costs of production through outsourcing-a mode widely practised in other industries as well.

Determinants

1. Entrepreneurial drive has been one of the key factors and a large number of young local entrepreneurs are driving growth. The success story of Tirupur can be mainly attributed to the entrepreneurial skills of the people coupled with hard work, commitment to the job. Culture is in supportive of entrepreneurial drive.
2. Role of Tirupur Exporters Association (TEA) in growth is phenomenal and a lot is attributed to the leadership of Shri.A.Sakthivel. TEA was set up in the year 1990 under the leadership of Shri. A. Sakthivel with a dream to make Tirupur a vibrant knitwear cluster under Global outsourcing for everything in knitwear. Currently TEA has 668 knitwear exporters as members and doing yeoman service to the exporters
3. TEA visualized the directions and dimensions of growth of knitwear sector sufficiently in advance, conceived, planned, and executed massive projects to sustain the growth and retain the dominance in knitwear exports. The projects completed are given below.

Tirupur export Knitwear Industrial Complex (TEKIC) is an exclusive industrial complex for the manufacture of knitwear for export, namely, Tirupur export Knitwear Industrial Complex, about 8 km. from Tirupur, in a sprawling 100 acres site to relieve congestion within the city and facilitate the expansion of production capacities. This consists of 189 industrial sheds with full-fledged infrastructure facilities such as power, water, roads, rainwater drainage, sewerage, security post and telecommunication. The investment in this complex has crossed Rs.200 crores and the value of production is estimated at Rs.800 Crores per annum

INLAND CONTAINER DEPOT (ICD) initiated by TEA named TEA LEMUIR Container terminals Private Limited, about 10 km. from Tirupur arranges for loading and unloading of export and import cargo in Tirupur itself. Exporters in Tirupur are now completing the customs formalities in Tirupur itself and sending the goods in containers directly for shipment through all southern ports and Mumbai.

TEA PUBLIC SCHOOL has all facilities of a modern educational institution and imparts education of very high standards to students irrespective of caste, the creed of religion-up to 12th standard.

TEAKTEX is a processing and production complex located in Kanjikode near Palakkad. A most modern process house is functioning for enhancing the quality of processing of knitwear cloth and garments to international standards. A few knitwear production units are also working in the complex. This is a joint venture project of the Government of Kerala and knitwear exporters in Tirupur.

NEW TIRUPUR AREA DEVELOPMENT CORPORATION LIMITED (NTADCL) is a Public Limited Company promoted by TEA jointly with the Government of Tamil Nadu, the Government of India, and Infrastructure Leasing and Financial Services Limited (IL & FS), Mumbai to supply water from Cauvery River - about 55 km from Tirupur for industrial and domestic use not only by the people of Tirupur but also those in more than 30 villages, en-route the pipeline. The massive project estimated to cost Rs. 1100 crores, also envisages underground sewerage system for Tirupur, collection, treatment and disposal of sewerage and solid waste.

NIFT - TEA KNITWEAR FASHION INSTITUTE set up to cater to the manpower needs of knitwear industry and export business in all areas of designing, manufacturing, marketing, and administration. The institute has state-of-art machinery and equipment, including CAD and offered testing, training, and designing services to the industry. The bachelor's degree programs offered are Apparel Fashion Design, Fashion Apparel Management, Garment Production and Chemical Processing, Apparel Manufacturing and Merchandising. The Institute also offers master's degree in Apparel Business and Apparel Production. The college is affiliated to Bharathiar University, Coimbatore.

INDIA KNIT FAIR (IKF) is constructed by TEA and AEPC as a Trade Fair Complex of international standards in a place about 12 km. from Tirupur, providing easy and fast access from Coimbatore airport to buyers visiting the Fair. The substantial increase in export of autumn/winter wear from Tirupur is on account of these fairs. Now Indian Knit Fairs-both summer and autumn / winter - are well known globally any buyers from world overlook forward to these fairs with lot of interest.

NETAJI APPAREL PARK has world-class production facilities to face the competition and challenges emerging in the post quote-free regime. The Park, first of its kind in India has come up in a 166 acres site in a strategic location in NH47. The park has 52 knitwear manufacturing facilities, with a total built-up area of about 2.0 million square feet with state-of-art machinery and world class infrastructure created with an investment of Rs.300/-Crores the park provides direct employment to more than 15,000/-persons. The park contribution for knitwear export turnover of Tirupur is about Rs.1500/- crores per annum

TEA-St. JOHN LOGISTICS PVT. LTD. have formed a Joint Venture Company in India of 50:50 ratio, in the name of TEA - St. JOHN LOGISTICS PRIVATE LIMITED and it was registered on 16th February 2006. With offices and support system in Antwerp, Belgium for warehousing and distribution of garments in Europe, this JV company offers one-stop solution for end-to-end service with focus on Supply chain for garment distribution at Antwerp, Belgium.

TEA E-READINESS CENTRE: Tirupur Exporters' Association has entered into a Memorandum of Understanding with Microsoft Corporation (India) Private Ltd., to set up e-readiness centres which offer e-readiness programme, e-learning modules and enhance solution delivery capability for local system integrators, resellers, and independent solution vendors. Microsoft will also develop a Tirupur cluster Portal which will have a public interface and a certain person accessible to SME community in Tirupur. Microsoft will help and provide online platform to facilitate collaborative exchange for addressing issues like regulatory compliances, environmental issues quality and certification procedures, Project Management and Textile design development.

4. Demand from leading brands has been one of the drivers of export growth. As far as the export is concerned, all leading brands Nike, Cutter & Buck, Adidas, GAP, Tommy Hilfiger, Katzenberg, Vanhussain Fila, Arrow etc., and leading chain stores like C&A, Wal Mart, Target, Sears, C&A and Mothers Care, H&M are sourcing from Tirupur. It was a fact that one of the garment manufacturers in Tirupur supplied T-Shirts to FIFA World Cup also.
5. Financial support: Tirupur has an extensive and well-developed network of banking systems operated by Indian public sector banks, private banks, and foreign banks as well. State Bank of India has a lead share which has been supporting by all leading banks operating in India. Banks have been providing support with market intelligence for exports and nurturing entrepreneurial talents.
6. Infrastructure likeroads, power and utilities have improved phenomenally due to the focus of the government to support the growth of this cluster.

Porter's Competitive Model as Applied to Tirupur:

Factor Conditions

1. Availability of raw materials from Dindigul and Coimbatore a major centre of cotton spinning mills in the country- makes Tirupur to easily access its basic raw materials
2. Labourers are available but become scarce. More often labours are provided on the job training. Getting skilled workers is a major challenge. Due to constant growth of the industry in the last few years the industry is facing severe shortage of labour. People who are migrating from rural areas do not have any prior experience in the industry. Therefore, the firms are full of mixed skill which affects the quality, production and cost of operations. With support of major labour unions and collusiveness, labour market has become expensive. Cost has been increasing, mobility is high and cost by of quality rejection due to poor workmanship is also considerable
3. Living conditions: Since the level of labour migration is high and there are no efforts to make housing available for the growing demand, many of the workers are living in, peripherals and nearby villages, with less sanitation facilities. Efforts to strengthen the

same is being acknowledged by industry feels that it is still inadequate.

4. Support Services like logistics, telecom, accounting, ESI & PF, services for testing and inspection are normally available at affordable cost.
5. Workplace environment: The premises of the export houses are good and as per the standards prescribed by the buyers. However, working environment at the sub-contracting units require to improvement. This is mainly due to their efforts to control the cost with in the 'payment for work' offered by the exporters and their limitation to make investment.
6. Strong entrepreneurial skills, and their direct management of day-to-day affairs contribute effective management and direct control of the operations. Risk-taking ability and drive to success are found to be high.

Demand Conditions

1. Though there has been volatility especially due to foreign currency fluctuations, there been a growing demand for the export market
2. Domestic market demand and positioning are weak, and no focused effort is being made especially for readymade garments.
3. Responsiveness and flexibility are perceived to be positively high by customers. Hence, the ability to manufacture quality garments at shorter production cycles is adding strength to Tirupur.
4. The main driving force in the cluster is the business environment. The quality and reliability of the products from the cluster are very high. Prevalence of business ethics, as expected by international buyers and readiness to face high risk in the market (perceived as an investment) are the driving forces for growth.
5. Another important factor for the growth of this cluster is proactive marketing. TEA has actively supported marketing and the Ministry of Textiles, and Apparel Exports Promotion Council have all helped to build brand India which is helping for demand conditions.

Firm's Strategy, Structure and Rivalry

1. At the micro level there has been intense competition and rivalry among firms. Winning orders and accomplishing delivery at competitive costs are keys to success. Firms have faced instances of undercutting order value to gain capacity utilisation and fuel growth.
2. There has been increased collaborative working and a high level of social capital created through informal networks of leading entrepreneurs and financial and industry bodies. EXIM bank and TEA are the leaders in streamlining firms' cooperation for maximizing growth.
3. The high level of subcontracting and knowledge shared on quality and buyer behaviour has been widely practised.
4. The industrial associations with proactive knowledge sharing, and the number of government schemes to support them have jointly benefited the cluster. The cluster has an excellent standing, in terms of collective firm strategy.

5. Adaptation of the latest technologies and inter-firm cooperation on production are high among large and medium size firms. However, such adoption is limited to the firms which are in the export market segment. Hence large number of firms are out of the network.

Related Supporting Industries

1. Support industries could be cotton processing, yarn, knitting, dyeing and so on for the readymade garments business. Apart from these directly related which could be part of the units, the others include services like banking, insurance, export trade handling, logistics, quality and inspection, financial services like foreign currency risk management, contract management and labour training and development, Information technology services and so on. The performance of all these support businesses is average to high mainly because of the inability of local trade to exploit their advantage.
2. The industry has grown considerably over the last one decade due to the joint initiatives taken by the firms, through their associations and government support. From being producers of basic knit garments for catering to the lower end of the domestic market, Tirupur knitwear manufacturers today have diversified to a wide range of garments, comprising T-shirts, polo shirts, sportswear, sweatshirts, ladies' dresses, children's garment, nightwear, etc. This cluster reflects the high degree of specialization in every area of the manufacturing operation, including machinery supply.
3. Since Tirupur is into the conversion of input to output based on design frozen by buyers, there have been fewer efforts Tirupur exporters are making garments based on the design supplied by the buyers. Investment in developing a design which is acceptable to the international buyer is heavy and Tirupur do not have the required skill and resources. This is an area of concern. Since buyers all over the world are gradually shifting the responsibility to make designs to exporters themselves to reduce their costs, it is necessary for the Tirupur exporters to make efforts on those lines to remain competitive.
4. Banking, insurance, and foreign currency risk management services are widely available with good standards and fair fee structures.
5. Logistics and Supply chain practices are at threshold level and driven more by buyers rather than by firm level or cluster initiatives.

Government Factor

1. Government programmes have been supportive of industrial development.
2. Investments in infrastructure, brand building and social capital are commendable though may be short of meeting adequate demand growth.

Thus, the main driving forces in the cluster are the strong factor conditions and joint initiatives in the form of firm strategy, structure, and rivalry. Different government schemes supported the growth, due to joint actions taken by the firms and dynamic firm strategies in the cluster. According to a study by Harvard University (Tirupur knitwear cluster Tamil Nadu, India, May 6, 2011), the export-centric cluster is exposed to volatilities in foreign markets and continues to produce low-value products. The cluster has weak local demand, moderate factor conditions, a moderate context for firm strategy and rivalry, and strong related and supporting

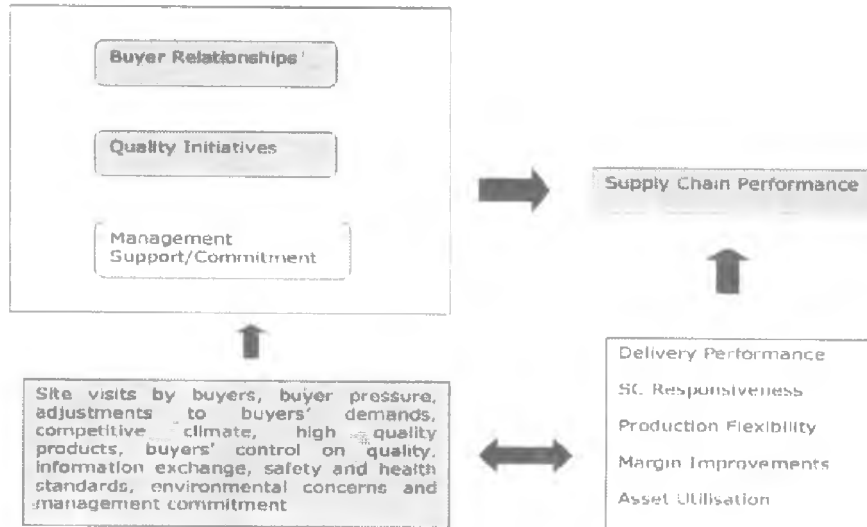
industries. There is an urgent need to address cluster-specific deficiencies for long-term competitiveness. These include a) strengthening infrastructure, b) innovating to produce high-value products and c) balancing export and domestic revenue channels.

Conclusion

- It is imperative for the SMEs to have a buyer orientation, a willingness to allow buyers to influence quality to go up in the value chain and more importantly to look for long-term collaborative partnerships with the buyers based on trust and commitment.
- It is also essential to have an innate thirst for 'quality'. Quality in the processes and quality in the product enhances the competitiveness and also the stature as a responsible corporate. This enables strategic positioning of the SME in the cluster.
- Site visits by buyers, buyers' demand for quality, buyer pressure and information exchange influence significantly the delivery performance, SC responsiveness, production flexibility, margin improvements and asset utilisation.
- Measurement of SC performance in an industrial cluster can also be constructed with composite indices (both qualitative and quantitative) and such a measure is capable of reflecting a better measurement than a construct that measures either qualitative or quantitative dimensions alone.
- The study confirms that the supply chain performance in the Tirupur industry cluster is strongly influenced by the determinants 'buyer orientation', 'quality initiatives' and 'top management support and commitment'.

The bigger players in the supply chain will have playoffs 'payoffs' when they look at potential SMEs for partnerships rather than subcontracting. This will help those SMEs to withstand testing times like that witnessed in recent times in Tirupur where small firms struggled to cope with electricity power cuts imposed by the state government. Policies of the central and state governments should work in tandem to create an enabling atmosphere as in the larger context of cluster philosophy. This is where an alignment of five-year plans of the country should have an embedded consideration of industrial growth with a focus on national and regional economies. It should also aid the adaptation of technologies and market demand as the industry evolves and competitiveness becomes the fulcrum for survival and growth. The small and medium firms, once they are constrained on resources, they are crippled. This can be quite disastrous for the industry in general and the cluster in particular. The competitiveness and efficiency of the supply chain then gets lost. Hence the momentum once gained should not be allowed to go waste.

Figure 7: Study Results Chain



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