CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Supply chain initiatives over the last decade, while frustrating at times, have proved enormously beneficial to businesses; the most successful innovators viewed the supply chain as a strategic tool for changing the rules of the game (Lee and Billington 1995). As a result, supply chain management and shareholder value are closely linked, and supply chain management will continue to have a major role in corporate success.

Barratt (2004), defines supply chain as network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and distribution of these finished products to customers. Balsmeier and Voisin (1996) states that supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry, and from firm to firm.

During the 1990s, business leaders were inundated with new supply chain initiatives from just-in-time inventory management to collaborative product commerce (Anderson and Narus 1990). Most of those programs were well conceived, but their complexity and misalignment with corporate operating models often produced conflicts, delays, and sub optimal results.
Other times, competing or overlapping agendas led to inflated budgets and project terminations, leaving executives exhausted and discouraged.

During the same decade, however, supply chain programs saved thousands of companies billions of dollars. Successful initiatives made it possible for companies to meet customer needs more quickly, less expensively, and through more channels; better-quality, more-reliable goods also reached the market sooner. And for the first time, mass-customized products and services became a reality. (Anderson And Narus 1990)

Davis (1993a) explains that with today's ultra competitive world of short product life cycles, complex corporate joint ventures, and stiffening requirements of customers, it becomes necessary to consider the complete scope of supply chain management in the manufacturing sector. He further adds that successful businesses will need better visibility into their supply chains; they must be better at collaborating with suppliers to meet customer demands. Suppliers will be asked to react quickly to changes in the business environment and perform at higher levels than ever before.

Therefore, to achieve optimal performance levels, manufacturers and distributors must have applications to help them communicate and collaborate efficiently, across the entire supply chain. Industries like electronics with fragmented supplier communities and outsourced manufacturing need supply chain applications that provide better visibility over multi-tiered supply chain operations. Right now, this is not being managed efficiently; research firms estimate that there are trillions of dollars lost to supply chain inefficiencies. (Banfield 1999)
1.2 WHAT IS SUPPLY CHAIN MANAGEMENT

Various definitions have been given to “Supply Chain” from various perspectives. Poirier’s basic definition for the supply chain is, “A supply chain is a system through which organisations deliver their products and services to their customers”. (Poirier 1997)

While the first definition has considered supply chain as a system the next views it as an “A supply chain is the alignment of firms that bring products or services to market”. (Lambert et al 2000)

Ganeshan et al (1995) have defined a supply chain in Indian context as “A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers”.

A similar statement can be seen in the definitions given by another Indian author Chopra et al (2001) where “A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers and customers themselves”.

From the above definitions and discussions the supply chain definition given by Chopra et al (2001) appears to be a good explanation of what a supply chain is, and a definition derived from all the above. Herein supply chain is taken as the chain of suppliers, manufacturers, wholesalers, distributors and stores that enable a product to be made, sold and delivered to the end user.
This shows that Indian manufacturing supply chains comprise of an interlinked network of suppliers, manufacturers, distributors and customers whereby material flows from the suppliers through manufacturers and distributors to the customers. In conventional supply chains, the primary flow of information is from the customer, back through the distributors and manufacturers before passing to the suppliers. Baily et al (1998) prescribe cost saving in supply chains as the key towards a profitable SCM practice as every £1 additional turnover will result in only a proportion of that sum in profit i.e. every £1 saved is £1 extra profit.

According to Lummus and Vokurka (1999), the supply chain is a complex combination of various organizations and should not be considered as a mere linear entity. They carry the focus beyond the companies' traditional boundaries to a vision that ranges from the suppliers to the ultimate customers.

Lummus et al (1999) here are referring to the complexity of the supply chains. Supply chains are not typically linear, but a network of vertical and horizontal integration of suppliers. It is this mix of integration that makes it difficult to manage especially in India because of problems relating to organisational structure, infrastructure, cultural issues etc.

And his view is well supported by Chopra et al (2001), they said that “in reality, a manufacturer may receive material from several suppliers (horizontally and vertically integrated to that manufacturer) and then supply several distributors. Thus, most supply chains are actually networks. It may be more accurate to use the term supply network or supply web to describe the structure of most supply chains”.
After exploring different views of supply chains by different authors it is quite understandable to comprehend what SCM is and what it does in context to supply chains i.e., as the management of materials and information both in and between facilities, such as vendors, manufacturing and assembly plants and distribution centers.

In support of this, Hugos (2003) has explained that Supply Chain Management (SCM) “is the planning and execution of supply chain activities, ensuring a coordinated flow within the enterprise and among integrated companies”.

It means these activities include the sourcing of raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels and, ultimately, delivery to the customer. The primary objectives of SCM are to reduce supply costs, improve product margins, increase manufacturing throughput, and improve return on investment”

1.3 IMPORTANCE OF SUPPLY CHAIN

To start with, while frustrating at times, Supply Chain initiatives over the last decade have proved enormously beneficial to businesses around the world. The most successful innovators like Dell viewed the Supply Chain as a strategic tool for changing the rules of the game Lee and Billington (1995). As a result, Supply Chain Management and shareholder value are closely linked, and Supply Chain Management will continue to have a major role in corporate success.

During the same decade, business leaders in manufacturing like Toyota had been inundated with new Supply Chain initiatives from just-in-
time inventory management to collaborative product commerce. However, supply chain programs saved many companies billions of dollars Baily et al (1998). Successful initiatives made it possible for companies to meet customer needs more quickly, less expensively, and through more channels; better-quality, more-reliable goods also reached the market sooner. And for the first time, mass-customised products and services became a reality. (Lee and Billington 1995)

A few Indian manufacturing companies like Hero Honda motors Ltd have been benchmarking the supply chain best practices. There is a need for all Indian manufacturing companies to foster these best practices to capitalise the market growth happening in India. (Sahay et al 2003a)

And while businesses in India often spend a lot of time and thought on strategic issues in the area of manufacturing, finance and marketing, they rarely focus on supply in a strategic vein. The focus on supply is purely operational i.e., they have been focusing only on the operational issues regarding quality of the product and the time in which a product is made and sufficiency of raw material to manufacture the products instead of viewing it as a part of supply chain issue and better the Supply Chain. If the supply issues are disregarded, such that the supply chain is excluded from the strategic debate, there is imbalance; exploitable opportunities are missed and the impact of the competitive threat is increased (Sahay et al 2003b)

Supply Chain Management is a way to supervise the flow of products and information as they move along the supply chain. The goal of SCM is to optimise the supply chain, which can not only reduce inventories, but may also create a higher profit margin for finished goods by giving customers exactly what they want (and of course charging for it).
Sahay Ramneesh Mohan (2003b) explained that “effective supply chain management (SCM) can make a whole lot of difference in making or breaking a company. Dell, Wal-Mart and Gillette are few of the many examples that are making use of effective SCM strategies and enjoying competitive advantages in the marketplace, both in terms of cost and customer satisfaction”. This suggests that Indian manufacturing companies have to foster these best practices of SCM to capitalise the out-sourcing opportunity from the western countries.

Supply Chain Management (SCM) has evolved with the aim of integrating different functions in an organisation into a harmonious network that would enclose the company's suppliers and customers. Keeping it flowing smoothly and efficiently requires an effective performance from suppliers, procurement, manufacturing, distribution and customers. To manage a Supply Chain in today’s business in the Indian manufacturing companies’ means thinking beyond established boundaries of Purchasing, Planning, Manufacturing, Warehousing and Logistics to managing the end-to-end flow of Information, Materials and Funds from the initial supplier to the ultimate consumer.

The more effective each link in the Supply Chain is, the better will be the customer demand being served. True Supply Chain Management exceeds a company's boundaries to involve every link of the Supply Chain. A truly integrated Supply Chain involves first information sharing, then coordination, and finally organisational linkages that enable sharing of risk, costs, and gains. Supply Chain Management creates and/or increases value in the chain thus increasing profits, market share, competitiveness, and customer satisfaction.
“A fluid flow of information and materials supports collaborative interactions between all along the supply chain. This in turn brings better products to the market sooner and allows support of those products. Measuring customer satisfaction is one way to determine if improvements are producing positive results”. (Sameer and Brian 2003)

In addition Francis Quinn (2004) stated that “supply chain processes are to be designed very well as it correlates directly to how effectively your supply chain actions can be executed. Poorly designed processes and procedures lead to substandard results--no matter how great your technology or how talented your people”.

This shows how important a supply chain strategically is for an organisation to succeed in these ever changing conditions of the market.

1.4 IMPLICATION OF CONVENTIONAL SUPPLY CHAIN IN INDIAN CONTEXT

It has been learnt from the above given definitions and explanations that a supply chain is a network of material and information that flows between suppliers, manufacturers, distributors and customers. It is also called as a demand pipeline, value stream or support chain.

A simple example of an Indian manufacturing conventional/ linear supply chain appears to be as shown in Figure-1. In this simple example, material flows from the upstream activities (left side) to the down stream activities (right side). The material flow is from the suppliers, who provide materials and subassemblies, to the manufacturers, who build, assemble, convert, or furnish a product or service. The finished products then pass to distributors, who transport and deliver the finished product to the customers.
While material flows from upstream suppliers to the downstream customers, information flow in this supply chain is considered to flow in the opposite direction, the customers order from the distributors, who then order from the manufacturers and so on down through the supply chain, from downstream to upstream (Chopra et al 2001).

![Diagram of a simple supply chain model]

**Figure 1.1 A Simple Supply Chain Model**

But in practice, supply chains are likely to appear to be much more complex in India than that shown in Figure 1.1. There may be a considerable network of suppliers to the suppliers, sometimes called second tier suppliers, and so on to third, fourth and perhaps fifth tier suppliers. In addition, there may be a network of distribution between manufacturing and the customer. This distribution network might include finished goods inventory, national distributors, regional distributors, local distributors and retail outlets.

To compound the complexity, each participant in the supply chain may be involved in a multitude of other supply chains, each vying for attention. Each manufacturer may, for example, be actively producing several
hundred end products, each requiring their own supply chain, probably with considerable overall between suppliers and distributors. Matching supply and demand under these circumstances can be very difficult because of the issues discussed earlier as company structures, transportation infrastructure etc. Furthermore, each supply chain is dynamic in nature, with variations over time in the participants and in such aspects as the level of customer demand or in available capacity (Baily et al 1998).

And this is well supported by Chopra et al (2001) where they have explained supply chains in Indian perspective as “in reality, a manufacturer may receive material from several suppliers and then supply several distributors. Thus, most supply chains are actually networks. It may be more accurate to use the term supply network or supply web to describe the structure of most supply chains”.

And in addition, Ganeshan et al (1995) stated that in conventional Indian supply chains, the marketing, distribution, planning, manufacturing and purchasing organizations along the supply chain operate independently. Individual organizations often have their own objectives that can often conflict. Consequently, there is not a single, unified plan or set of objectives for an organisation in fostering Supply Chain Management.

1.5 NEED FOR THE STUDY

Very little research has been done in India on the impact of Supply Chain Practices on Supply Chain flexibility, competitive advantage and organization’s performance. Most of the worldwide studies have considered very large firms. This has left a gap in the studies done in small manufacturing sector in India. Most studies have focused on metrics and individual performance issues of firms. There has hardly been any research
aimed at building and validating theoretical models in India. This has left the following questions unanswered

a. Do small manufacturing firms follow supply chain practices?

b. Are supply chain issues relevant to small manufacturing firms?

c. Do traditional supply chain theories hold good for small manufacturing firms?

d. Is information flow valued by small manufacturing firms?

e. Can the theories that are relevant to large firms be generalized to small manufacturing firms?

This research aims to answer all the above questions and validate a comprehensive supply chain model for the small manufacturing sector in South India.

1.6 OBJECTIVES OF THE STUDY

This study has considered the following objectives for research study.

1. To test the impact of Environmental Uncertainty that the firm faces on the Supply Chain Practices followed by the small manufacturing firms in and around Coimbatore City

2. To test the impact of Supply Chain Practices followed by small manufacturing firms in and around Coimbatore city on their Supply Chain Flexibility.
3. To test the impact of Supply Chain Flexibility of small manufacturing firms on their Competitive Advantage in the marketplace.

4. To test the impact of Competitive Advantage of a small manufacturing firm on its overall Performance in the marketplace.

1.7 SCOPE OF THE STUDY

The research work was conducted in south India considering small manufacturing firms registered with CODISSIA. Only manufacturing firms with less than 100 employees were considered. The research was confined to supply chain issues of individual companies only and not the entire supply chain from end to end. All types of small manufacturing firms have been considered in this study.

1.8 RESEARCH DESIGN

The research is a single cross sectional descriptive research done using survey methodology. A cross section of small manufacturing industries in and around Coimbatore city was considered. The sample frame comprised of manufacturing firms listed with Coimbatore District Small Scale Association of India (CODISSIA). This list was chosen as it is the only list that contains a cross section of the manufacturing industries in and around Coimbatore. All other lists focused on specific industries alone. This list was filtered to contain manufacturing firms having less than 100 employees (792 firms comprising of Auto Ancillary -45, General Ancilliary-81, Fabrication-48, Foundry-79, Pumps-110, Textile Machinery 45, Other Manufacturing Units-384). From this list a sample of 75 companies (See Appendix 2) was chosen using random sampling technique for administering the structured questionnaire.
Small manufacturing industries are the backbone of the supply network to large manufacturing firms. Since they are an important part of the overall supply chain structure, they should also be studied to validate existing supply chain theories. Since all current theories only consider only large firms, there is a void in research of supply chains of small manufacturing firms. This study aims to fill this void partially.

1.9 STATISTICAL TOOLS USED

This research was conducted using the following statistical tools.

Power Analysis was used to calculate the sample size (G Power 3 software) based on significance level used power of the test and measure of effect size (Appendix 2).

Construct reliability analysis was done using Cronbach’s alpha measure with SPSS software to determine the reliability of the various dimensions being studied (Appendix 4).

Correlation analysis between construct scores was conducted to test the significance of correlation between related constructs.

PLS Path Modeling structural equation technique was conducted on the model proposed to ascertain the validity of the constructs proposed and the paths postulated in the model (Appendix 4).