

LOGISTIC MANAGEMENT AND THE HARMONIZATION  
REQUIREMENT FROM VIEW OF POINT TURKEY'S FULL  
MEMBERSHIP TO THE EU

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## **ABSTRACT**

Turkey has the heritage of a State which maintained the most tolerant administration during the Middle and Modern Ages, which granted freedom of religion and languages for six centuries, and which managed to keep those nations together with their cultures and languages. Turkey establishes a very important link between Europe and the Black Sea, Central Asian countries. It also contributes to cultural, social and political rapprochement between the Islamic and Christian worlds.

The internationalization of the world economy has substantially increased border-crossing activities between companies. Consequently, logistics has become a strategic weapon for the success of global firms. By minimizing the costs in the value chain or providing customers with differentiated services, logistics acts as a major source of competitive advantages.

It is crucial for firms to design their logistics structure on the international basis. Design and control of these international structures has become a complex managerial issue. Common solution for many global companies is to outsource logistics services from third party service providers, through which companies could be more focused on their core business.

The current trend in the market is to decrease the number of local distribution centers (DCs) while establishing more centralized warehouses. All in all, it is not certain whether the modernization process has already developed a momentum strong enough to push Turkey further along its current path also without the accession perspective. However, modernization in logistics is being significantly accelerated due to EU assistance and by the effort to become a full EU member.

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## TABLE OF CONTENTS

<b>CHAPTER 1. INTRODUCTION.....</b>	<b>1</b>
1.1 BACKGROUND.....	1
1.2 SUMMARY OF LOGISTICS.....	2
1.3 REASONS FOR CHOICE .....	5
1.4 LOGISTICS HISTORY AND DEFINITION.....	7
1.5 SUPPLY CHAIN HISTORY AND DEFINITION .....	10
<b>CHAPTER 2. THEORETICAL FRAMEWORK.....</b>	<b>11</b>
2.1 FLOWS IN LOGISTICS .....	11
2.1.1 MATERIAL FLOW.....	12
2.1.2 INFORMATION FLOW .....	12
2.1.3 CONCEPTION OF MATERIAL AND INFORMATION FLOW.....	13
2.1.4 LOGISTICS INFORMATION FLOW .....	14
2.2 PROCESS ANALYSIS AND FUNCTION FLOW.....	16
2.2.1 PROCESS ANALYSIS SCHEDULE.....	16
2.2.2 FUNCTION FLOW SCHEDULE .....	17
2.3 LOGISTICS STATUS FROM THE FIRST PL TO THE FIFTH PL.....	19
2.3.1 PERSPECTIVE OF NUMBERS .....	19
2.3.2 2PLs – CAPACITY PROVIDERS.....	21
2.3.3 3PLs – OUTSOURCED LOGISTICS SERVICE .....	21

2.3.4 4PLs – INTEGRATED LOGISTICS SERVICE .....	23
2.3.5 5PLs – THE REAL SENSE SUPPLY CHAIN MANAGEMENT ...	23
2.4 SUPPLY CHAIN MANAGEMENT .....	25
2.4.1 SCM IN DEFINITION.....	25
2.4.2 IMPLEMENTING EFFECTIVE SCM STRATEGIES.....	26
2.4.3 OUTLINE FOR ANALYSIS SCM .....	29
2.4.4 THE SUPPLY CHAIN OBJECTIVES AND PRINCIPLES .....	30
2.4.4.1 Objectives .....	30
2.4.4.2 Modelling Principles .....	31
2.4.4.3 Implementation of The Developing Strategy.....	34
2.5 INBOUND LOGISTICS .....	35
2.6 INVENTORY MANAGEMENT .....	36
2.6.1 OBJECTIVES AND TYPES OF INVENTORY.....	37
2.6.2 INVENTORY MANAGEMENT PERFORMANCE .....	39
2.6.3 INVENTORY CARRYING COSTS AND CASH FLOW.....	40
2.6.4 INVENTORY MANAGEMENT IN UNCERTAIN MANNER.....	42
2.7 THE LOGISTICAL MEASUREMENTS .....	42
2.7.1 LOGISTICAL SERVICE .....	44
2.7.2 TIED UP CAPITALS AND LOGISTICAL COST.....	47
2.8 GAINING COMPETITIVE ADVANTAGE.....	37
2.8.1 COMPETING THROUGH LOGISTICS .....	47
2.8.2 THE TOTAL COST CONCEPT.....	49
2.8.2.1 Logistics System in Customer Service.....	49
2.8.2.2 Warehousing Costs .....	50

2.8.2.3 Order-Processing/Information Systems Costs.....	51
2.8.2.4 Transportation Costs.....	52
2.8.3 TIME-BASED AND COST-BASED MANAGEMENT.....	52
2.8.4 OVERCOMING AN INTEGRATED SUPPLY CHAIN.....	53
2.8.4.1 Functional Perspective .....	54
2.8.4.2 Process Perspective.....	54
2.8.4.3 The Evolution of Integrated Supply Chain.....	55
<b>CHAPTER 3. CASE STUDY.....</b>	<b>56</b>
3.1 CASE STUDY OF REYSAS LOGISTICS A.S.....	56
3.1.1 ABOUT THE COMPANY.....	56
3.1.2 LOGISTIC SECTOR AT GLANCE.....	58
3.1.3 FINANCIAL DATAS.....	59
3.2 CASE STUDY SAAB AUTOMOBILE AB.....	61
3.2.1 COMPANY PROFILE.....	61
3.2.2 LOGISTICS STRATEGY IN SAAB AUTOMOBILE AB.....	61
3.2.3 CURRENT STRUCTURE OF SAAB AUTOMOBILE AB .....	62
3.2.4 REGIONAL LOGISTICS INFRASTRUCTURE .....	63
3.3 DATA ANALYSIS AND EVALUATION.....	65
<b>CHAPTER 4. ANALYSIS OF DATA.....</b>	<b>67</b>
4.1 CURRENT SITUATION IN LOGISTICS .....	67
4.2. LOCATION DETERMINANTS IN LOGISTICS.....	69
4.3 SUPPLY AND DISTRIBUTION STRUCTURE.....	70

4.4 LOGISTICS STRATEGY IN EU PROCESS .....	71
4.4.1 THE STRATEGY.....	71
4.4.2 THE PLAN AND LEVEL.....	74
4.4.3 THE PRIORITY AREAS OF EUROPEAN LOGISTICS POLICY...	75
4.4.4 LOGISTICS STRATEGIC PLANNING.....	76

**CHAPTER 5. CONCLUSION .....77**

5.1 BACKGROUND PICTURE .....	77
5.2. DEVELOPING TECHNOLOGY.....	78
5.2.1 PRESENTING INFORMATION VISIBILITY.....	78
5.2.2 BENEFITS SHARING .....	79
5.3 DEVELOPMENTS IN BUSINESS ENVIRONMENT.....	80
5.4 NEW INSIGHTS.....	81
5.5 TRENDS IN LOGISTICS REQUIREMENT.....	82
5.6 E- SUPPLY CHAIN.....	85
5.7 ACTIVITIES.....	87

**CHAPTER 6. APPENDICES.....88**

APPENDIX A REYSAS LOGISTICS A.S.....	88
APPENDIX B AUTOMOBILE LOGISTICS.....	90
APPENDIX C CAR WAREHOUSING.....	91
APPENDIX D FOREIGN TRADE TURKEY AND EU .....	92



**CHAPTER 7. REFERENCES .....93**

## **LIST OF FIGURES**

Figure 1.1 LOGISTICS STRUCTURE.....	3
Figure 1.2 MAIN OUTLINE OF THE THESIS .....	6
Figure 1.3 LOGISTICS AND SUPPLY CHAIN .....	9
Figure 2.1 FLOWS IN LOGISTICS .....	11
Figure 2.2 PROCESS ANALYSIS SCHEDULE .....	17
Figure 2.3 1PL AND 5 PL.....	19
Figure 2.4 SUPPLY CHAIN BARRIERS.....	29
Figure 2.5 INVENTORY TURNOVER .....	41
Figure 2.6 DISTRIBUTION STRUCTURE OF MULTINATIONAL COMPANIES.....	43
Figure 2.7 INTEGRATED SUPPLY CHAIN ACHIEVEMENT.....	56
Figure 3.1 GLOBAL LOGISTICS .....	59
Figure 3.2 SUPPLY CHAIN FINANCE CHALLENGES.....	62
Figure 4.1 LOGISTICS IN ECONOMY.....	70
Figure 5.1 SUPPLY CHAIN OPTIMIZATION .....	80
Figure 5.2 LOGISTICS EFFICIENCY ELEMENTS AND RETURN.....	85

## **LIST OF TABLE**

Table 4.2 COMMON SUPPLY CHAIN FINANCE APPLICATIONS.....	72
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## LIST OF ABBREVIATIONS

CLM	: The Council of Logistics Management
ERP	: Enterprise Resource Planning
OEM	: The original equipment manufacturer
MRP	: Material Requirement Planning
SKU	: Stock-keeping units
EDI	: Electronic Data Interchange
GPS	: Global Positioning System
JIT	: Just in time
SCM	: Supply chain management
SCOR Model	: Supply Chain Operation Reference Model
SKU	: Store Keeping Units
VMI	: Vendor Managed Inventory
VRM	: Vendor Relationship Management
4PL	: Fourth Party Logistics (Provider)
3PL	: Third Party Logistics (Provider)
TRY	: The official abbreviation for the Turkish Lira
FX	: Foreign Exchange

# **CHAPTER 1 INTRODUCTION**

## **1.1 BACKGROUND**

There is no doubt that globalization of world business has resulted in significant changes in the global marketplace. Multinational companies (MNCs) today must globalize manufacturing and marketing operations because of the increasing competitive pressure in industrialized markets and increasing accessibility to world markets (Fawcett & Closs, 1993). There is a strong need for MNCs to develop new competitive strategies and re-evaluate their approaches on the global basis.

Things that happened during the last several decades e.g., growth in foreign direct investment (FDI), growth of economy, removal of trade barriers, regionalization, deregulation, technical development of information technology (IT) greatly enable the globalization process and provide more utilities for companies to do business worldwide (Bowersox & Closs, 1996). Many firms' international expansions are achieved either through exports or establishments of foreign manufacturing and/or distribution facilities. The physical

structures of many industrial firms are highly related to international elements. Design and control of these global structures has become a complicated managerial issue. (Vos, 1997)

Nowadays, an effective way for MNCs to achieve global success is through deepening their value chain in foreign areas (Choi, 1999).

As a consequence, logistics becomes location of strategic importance and a source for competitive advantage (Bagchi & Virum, 1998), because it is of great value-added potential and best position to provide supply chain optimization in the international transaction process (Cooke, 1999).

However, globalization involves much more than simply importing or exporting goods or materials (Bowersox & Calantone, 1998).

## **1.2 SUMMARY OF LOGISTICS INDUSTRY**

Under the era of globalized economy, the intensified competition pushes companies to contract out logistics operations and cut costs in an effort to concentrate on core competences. The logistic industry began to transform from the traditional transportation industry and this is continuing at a rapid rate.

Logistics deals with the flow and storage of goods and related information, as defined by the Council of Logistics Management. All the processes of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in process inventory, finished goods, and related information from point-of-origin to point-of-consumption are for the purpose of conforming to customer requirements. Logistics, previously viewed as a classical function, which involves adversarial relationships among suppliers, customers and transportation providers, is emerging as a key source of competitive advantage and a leading reason for strategic alliance relationship between companies and their logistics providers.

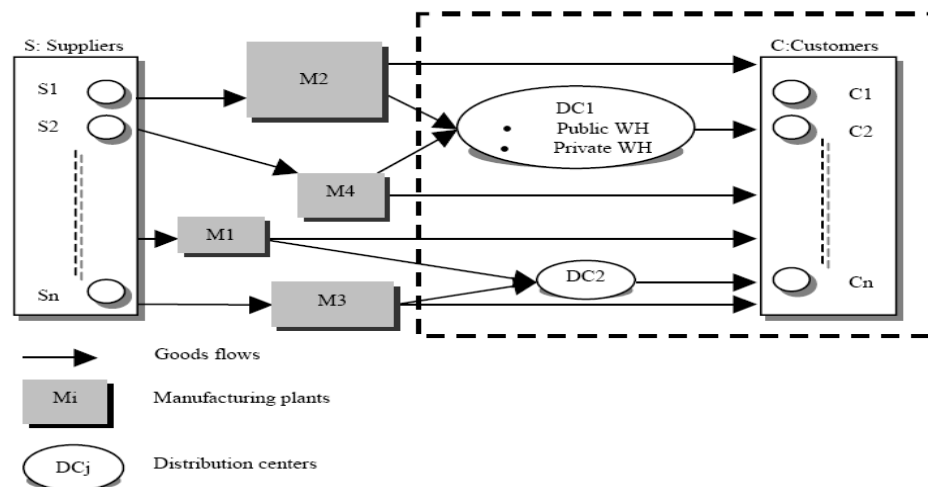


Figure 1.1 Logistics Structure ( Source: Developed from Vos,1997 )

According to Ross, logistics can be seen as evolution through four distinct areas: warehousing and transportation management, total cost management, 4PL. Developed based on the basis of 3PL, 4PL act as

leverage to the capacity of third-party logistics providers, technology service providers, and business process managers to create a solution through a centralized point of contact.

All of these developments so far are in the vertical levels or are functionally oriented, which mainly concentrates on the outbound logistic area from the end-producer to the customer. We believe that the further development of the logistic industry will take place in the horizontal level of the value chain. Logisticians will expand their business towards the upper stream of value chain by which the whole logistic supply chain is integrated from suppliers through manufacturers and all the way down to the end customers. In another words, from the outbound part penetrating into the inbound part, the centralization effect could be maximally leveraged.

Within the realm of business logistics, today's changing industry dynamics have influenced the design, operation and objectives of supply chain systems by increasing emphasis on improved customer service levels, reduced cycle time, improved quality of products and services, reduced costs, integrated information technology and process flows, planned and managed movement, and flexibility of product customization to meet customer needs.

It has certainly also put logistics firms to the test: Outsourcing of supply chain management provides demonstrable advantages, but in many

cases the supply chain itself has to be restructured if substantial savings are to be achieved. Thus, there is an increasing demand for experts capable of overseeing such restructuring.

In the name of efficiency, information technology has been adopted to support logistics for many years. Recent developments in technology have brought information to the forefront of resources from which forward-thinking firms can cultivate genuine competitive advantage. The major technology behind improved information flow was the advent of electronic data interchange (EDI). It offers greatly improved information flows and is an extremely important aspect within leading organizations in the fight to decrease lead-times. Today, the information flow has been shown to be the backbone of the logistic system. How to optimize the information flow to leverage the effectiveness and efficiency of the whole logistic system is one of the most important areas in which the logistic providers are competing with each other in.

### **1.3 REASONS FOR CHOICE**

Logistics is a sophisticated function for a company, and it is suitable for outsourcing. Especially in developing countries, companies will select the easiest options while trying to satisfy their requirements. Therefore there will be great expansion in contract logistics sector in developing countries.



As Turkey fits in this description, knowledge of the third party logistics providing industry would be an asset for the EU logistics policy.

Developing countries always take the best technology, use the most recent applications and do not spend time for methods that are tried and found to be inefficient. That is one of the reason for selecting a relatively new issue for dissertation. If there are benefits of logistics, it is for sure that the shippers in very near future will demand it. The parts are mentioned as shown in the figure 1.2

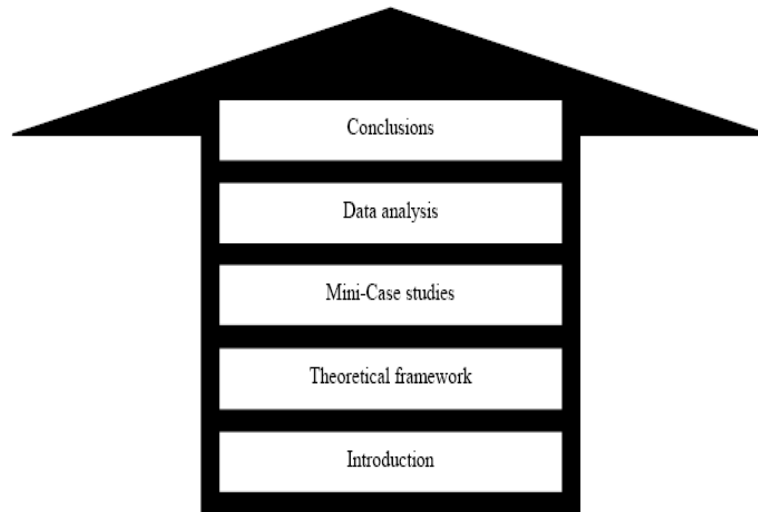


Figure 1.2 Main Outline of The Thesis (Source : Own)

The need to examine the logistics market situation and satisfying the desire to study alliance management in EU process were the main reasons for choosing the subject for dissertation.

## **1.4 LOGISTICS HISTORY AND DEFINITION**

The 15<sup>th</sup> Edition of the New Encyclopaedia Britannica mentions that the word 'logistics' stems from the Greek 'logistikos', the science of computation or calculating. A 'logista' was an administrative official in the Roman and Byzantine armies. It took until the 18<sup>th</sup> century that Baron Jomini defined logistics as 'the practical art of moving armies' including supply of materials. In the military, logistics got the attention since World War II; it caused the birth of a mathematics discipline now known as Operations Research. (Van Rijn, 1989) The recent Persian Gulf War again demonstrated the importance of logistics to a successful military effort. In fact, the Persian Gulf effort has been referred to as the 'logistics war'. (Coyle et al, 1996)

At the business side, one of the most used definitions of logistics is:

'Logistics is the process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, manufacturing process, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customer requirements.' (Council of Logistics Management, USA)

‘Seven Rs’ is another popular definition of logistics:

‘Ensuring the availability of the right product, in the right quantity and the right condition, at the right place, at the right time, for the right client, at the right cost.’ (Shapiro and Heskett, 1985)

Logistics is the collection of activities associated with acquiring, moving, storing and delivering supply chain commodities (i.e., products in all stages of manufacture, services and information). Logistics encompasses the business functions of transportation, distribution, warehousing, material handling, and inventory management, and interfaces closely with manufacturing and marketing.

Logistics supply chains (also called logistics systems or logistics networks) arise in numerous business segments and government functions, including: manufacturing companies, retailing firms, food producers and distributors, the military, transportation carriers (such as trucking and railroad companies), service companies, postal delivery, utilities, petroleum pipelines, and public transportation. (Ratliff & Nulty, 1999)

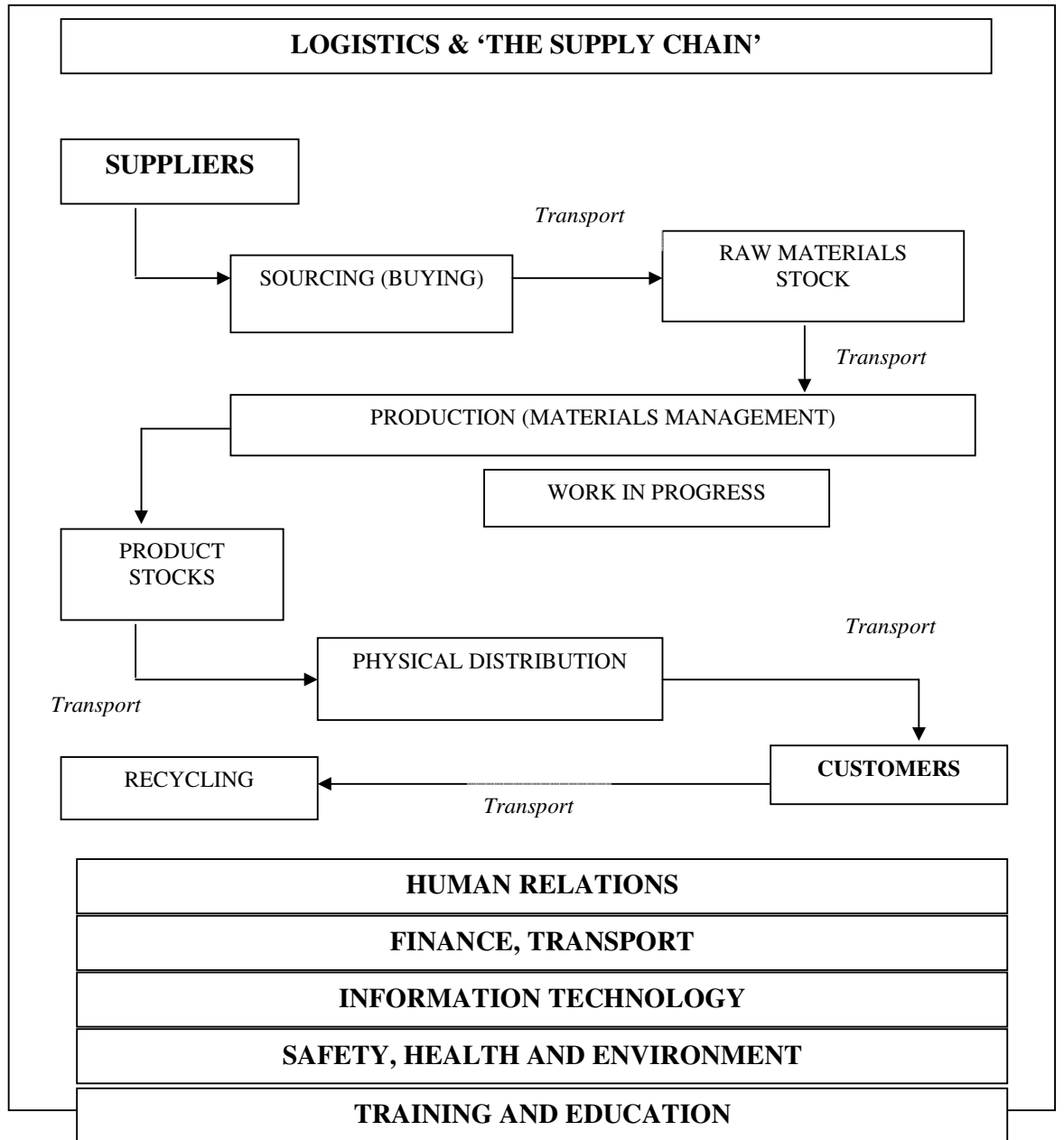


Figure 1.3 Logistics and The Supply Chain

( Source : Institute of Logistics and Transport)

## **1.5 SUPPLY CHAIN HISTORY AND DEFINITION**

A supply chain is the collection of all components and functions associated with the creation and ultimate delivery of a good or service.

(Ratliff & Nulty, 1999)

One of the well-known supply chain academists, Martin Christopher defines supply chain as:

‘The network of organisations that are involved, through upstream and downstream linkages, in the different processes that produce value in the form of goods and services for the ultimate customer... Thus, for example, a shirt manufacturer is a part of a supply chain that extends upstream through the weavers of fabrics to the manufacturers of fibres, and downstream through distributors and retailers to the final customer.’

(M. Christopher ,1998)

## CHAPTER 2 THEORETICAL FRAMEWORK

### 2.1 FLOWS IN LOGISTICS

Logistics has been described through its attributes and logistics is concerned with the flows within the chain in previous chapter. The flows of logistics are monetary, information, material and resources. Monetary flow is concerned with invoicing and payment, resource flow represents the resources that are needed to move the material within the chain and the material flow is the goods to be moved. The information flow is the initiator for both monetary flow and material flow.

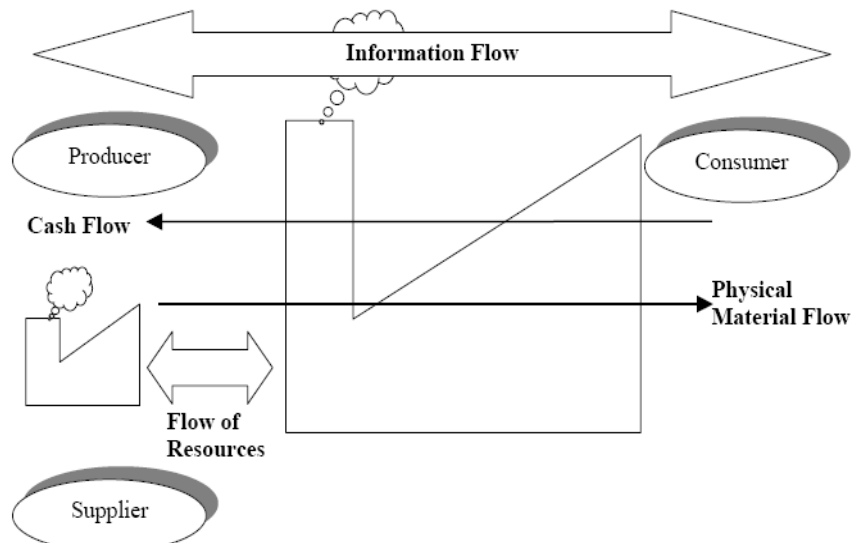


Figure 2.1 Flows in Logistics (Source: Own)

### **2.1.1 MATERIAL FLOW**

The material flow represents the supply of product through the network in response to demand from the next organisation. The issue here is how long does it take to get the product through the various stages from one end of the chain to the other. The focusing on time is important here because it measures how quickly a given network can respond to demand from the end customer. Often it is difficult to see where the flow starts in the chain and where it ends.

### **2.1.2 INFORMATION FLOW**

Information is a collection of facts that is organized in such way that they have additional value beyond the value of the facts themselves. Today the information flow within the logistics has become vital as, this flow enables chains to respond in real time with accurate data. Firms today look at information flow as an asset, since it is not possible to have efficient and reliable material flow without it(Mattson ,S-A,2002). To manage and communicate a material flow today, IT is necessary.

### **2.1.3 CONCEPTION OF MATERIAL AND INFORMATION FLOW**

There is no doubt that information flow is important and it is important to evaluate what kind of information adds value to the particular logistics system in focus.

The ability to change data into useful information is essential; otherwise it will only be data. To transform data into information that is of no use only costs money. Therefore the companies or departments within a chain have to agree about what kind of information adds value before taking decisions on what information should be produced and shared.

According to Mattsson 2002 there is also an information flow in the other direction that is concerned with the issue of what is possible to obtain. Mattsson 2002 claims that it is not just the supplier who needs different types of information regarding requirements.

Logistics includes all the activities to move product and information to, from and between members of a supply chain according to Bowersox. Within the context of supply chain, Bowersox refers to five critical flows: information, goods, service, financial and knowledge. Logistics is the primary conduit of product and service flow within a supply chain



arrangement and the process of logistics is viewed in terms of two interrelated flows and that is information and inventory(Bowersox,D. Et al, 2002).

#### **2.1.4 LOGISTICS INFORMATION FLOW**

The stream of data in different directions with variable contents between various databases (departments) within a company is defined as information flow.Moberg identify two kinds of logistics information such as operational and strategic information. Operational information typically encompasses shortterm, quantitative information about daily logistics/sales activities or status information on orders and inventory levels. It is primarily used to reduce order cycle times and inventory levels and to improve customer service. In contrast, strategic information covers long term issues related to the firm's marketing, logistics, and other business strategies. This long-term, qualitative, and sensitive information is primarily used to improve collaboration among supply chain partners and plan for the future logistics practices based on upcoming strategy differences(Moberg C. Et al ,2002 ).

Moberg's definition of operational and strategic information is almost equal to Bowersox's criterias of logistics information utilisation in two major logistics processes:

**Planning/coordination:** the overall purpose of planning/coordination is to identify required operational information and to facilitate supply chain integration via strategic objectives, capacity constraints, logistics requirements, inventory deployment, manufacturing requirements, procurement requirements, and forecasting.

**Operations:** accurate and timely information to facilitate logistics operations. Operational information is required in six related areas: order processing, order assignment, distribution operations, inventory management, transportation and shipping, and procurement.

As a result, Bowersox name four reasons why timely and accurate information has become more critical for effective logistics systems' design and operations:

- Customers perceive information about order status, product availability, delivery schedule, shipment tracking, and invoices as necessary elements of total customer service.
- With the goal of reducing total supply chain assets, managers realize that information can be used to reduce inventory and human resource requirements.
- Information increases flexibility with regard to how, when, and where resources may be utilized to gain strategic advantage.

- Enhanced information transfer and exchange capability utilizing the Internet is changing between buyers and sellers and redefining the channel relationships.

## 2.2 PROCESS ANALYSIS AND FUNCTION FLOW

There are different means that could be used when configuring the process, but below there will be a presentation of two: process analyse schedule and function flow schedule.

### 2.2.1 PROCESS ANALYSIS SCHEDULE

The purpose of process analysisschedule is to map out in what order the different activities within the process of the study occur. This is of great value when there is a need to study the time and the cost for carry out different activities. The figure below gives an example how the schedule might look ( Mattsson, S-A., 2002).

No.	Activity decription	Time	Cost	Type of activity
1				
2				
3				
4				
5				

Figure 2.2 Process Analysis Schedule (Source: Mattsson, S-A., 2002.)

In the form the processes are noted in the order that they are carried out. The time it takes is noted and also the cost. The time it takes could be of two different types, the actual time it takes to do the activity or the passing through time for the activity at each department. In the form there is also space to note what kind of activity it is. For example, it could be that something is actually done, or it is waiting, or in transport or in a warehouse. With help from the noted time needed and the cost, the total cost and total time required can be calculated for the process as a whole (Mattsson, S-A., 2002).

### **2.2.2 FUNCTION FLOW SCHEDULE**

The function flow schedule not only shows the activities that are carried out but also in what order they are carried out. The schedule also shows who carries out the activity. Who in this case could be an individual or a department. If this is a schedule of a supply chain process, this will also include in what company the individual or department is to be found. When all of the activities and connections between the activities are mapped, the processes should be critically analysed. A way to do this is to systematically question the activities by asking the following questions:

What?	The purpose of the activity	Why must this activity be done
Where?	The place for that particularly activity	Why must is be done at this particularly place
Where?	The place for that particularly activity	Why must is be done at this particularly place
When?	The sequence in what the activity	Why must it be performed at this moment is performed
Who?	The individual who carry out the activity	Why must it be this individual
How?	The way the activity is carried out	Why must the activity be carried out in this way

The overall purpose is to ask these questions for each of the activities and try to eliminate, combine, change or simplify the different activities that are carried out in the process that should be rationalised( Mattsson, S-A., 2002).

## 2.3 LOGISTICS STATUS FROM THE FIRST PARTY LOGISTICS TO FIFTH PARTY LOGISTICS

### 2.3.1 PERSPECTIVE OF NUMBERS

The concepts of 3PL (the third party logistics), and 4PL (the fourth party logistics) reflect the evolving demands of manufacturer essentially to own and handle all logistics functions, such as trucking and warehousing.

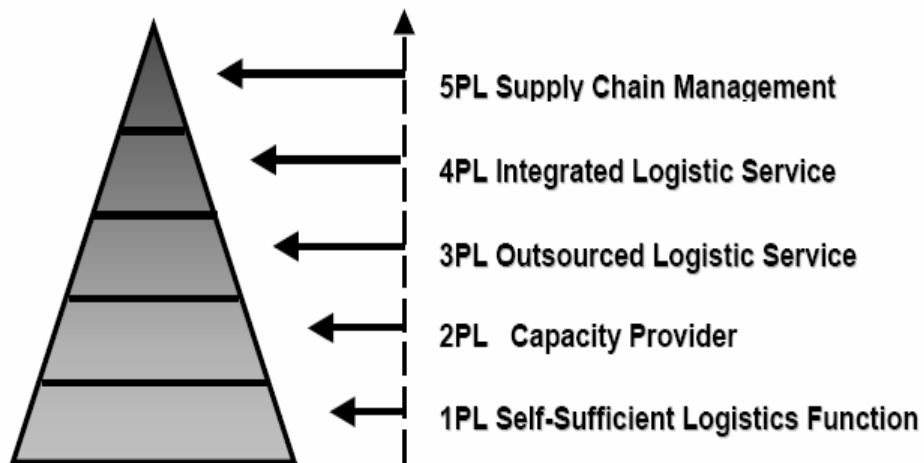


Figure 2.3 1PL and 5 PL (Source: Adapted from Morgan Stanley Report.)

Most small businesses buying and selling in the same location are 1PL. As the business expands geographically, the manufacturer's logistics border grows, a 2PL provider is generally a commodity capacity provider, such as a trucking company or a warehouse operator, a 2PL provides service for a single or a small number of functions in the supply chain. They face low returns, with high levels of asset intensity but low barriers of entry. Next

come the distributors, who through a dense network or legislative protection have achieved higher returns, albeit on a sizeable cost base. Examples are the express parcel operators that charge premium pricing for timely delivery, and the postal operators.

With the increasing demand for one-stop solutions, many 2PLs have evolved into 3PLs by adding new logistics capabilities and integrating their operations. It may or may not involve asset ownership. 3PL is a broader term that is frequently used to cover businesses in freight forwarding or contract logistics. It performs all or a large portion of a client's supply chain logistics activities, and its value adding is based on information and knowledge versus a nondifferentiated transportation service at the lowest cost. 3PL tends to be assetlight with high returns. The 4PL provider is essentially a logistics integrator or a one-point contact for the manufacturer's logistics outsourcing requirements.

They are responsible for contracting various 2PL and 3PL providers, and for assembling and managing those end-to-end solutions. The 4PL provider, with its complete overview of the supply chain as well as strong logistics and IT capabilities, can also offer high value added advisory services to the manufacturer.

### **2.3.2 2PLs CAPACITY PROVIDERS**

As a general rule the commodity capacity providers (2PLs) face the worse return outlook, with high levels of asset intensity but low barriers to entry. Basic transportation providers such as truckers, air freighters and container lines fall into this category. With a high fixed cost base and a volatile revenue stream, the outcome is usually low and unpredictable. Airports and seaports as capacity providers are also categorized as 2PLs, but their returns are generally better and more stable than those of basic transportation providers due to their relative scarcity, natural geographical monopoly and relative insulation from the fluctuations of fuel prices.

On the next level, there are the express parcel operators. The major global express parcel operators are all seeking to combine 3PL and express parcel activities to provide integrated whole supply chain logistics.

### **2.3.3 3PLs OUTSOURCED LOGISTICS SERVICE**

Most 2PLs and express companies strive to become 3PLs for higher returns. While 3PLs do own some assets such as key distribution centers in strategic locations or a small trucking fleet to fill emergency needs, they may outsourced most of their capacity needed by 2PLs. Hence the terms 3PLs



focus on logistics solutions and look for the optimal combination of assets available from capacity providers, 3PLs are less asset intensive and are thus nimbler in the operation of assets available from capacity providers, therefore they have higher returns on assets employed. Their logistics management expertise makes them increasingly counter-cyclical - the worse the cycle, the more companies need to optimize their supply chains. A customer is more reluctant to change its 3PL provider than a 2PL. There exists therefore higher customer loyalty and revenues stability.

However, 3PLs do not deliver the kind of great margins which many companies are looking for. This is simply because 3PL make money by helping customers save. It offers higher return than traditional transport because of higher growth of demand. Economies of scale are crucial for 3PLs to be profitable, as they need to support extensive logistics networks.

#### **2.3.4 4PLs INTEGRATED LOGISTICS SERVICE**

The services of 3PL sometimes overlap with the 4PLs. The 4PL segment is more lucrative because these firms charge consulting fees. Currently, 3PL companies are trying to turn themselves into 4PL companies in providing better service satisfaction to their related customers.

It can be said that 4PL are based on the development of 3PLs and it is an extension of 3PL, it provides value added service such as planning, information technology integration, transport planning, order tracking and tracing, logistics consulting, application solution, and financial services. But all these functions focus on improving a close linkage to its served customer. From the logistic company to its consigners, as a 3PL company its task is to transport the goods from consigner to consignee, and to be a 4PL provider, 3PLs need to find ways to build strong relations between themselves and their customers, with the above-mentioned supporting function to reach the highest level of service efficiency i.e., 4PL are integrated logistics management.

### **2.3.5 5PLs THE REAL SENSE SUPPLY CHAIN MANAGEMENT**

The 5PL solutions focus on providing overall logistics solutions for the entire supply chain. Supply Chain Management (SCM) is the integration of the activities associated with the flow and transformation of goods in the respective logistics networks through improved supply chain relationships based on a common collaborative performance measurement framework for attaining close, collaborative and well coordinated network relationships to achieve a competitive advantage.

As the trends in the last decade were to define core competence for each enterprise, the traditional full-scale company has abolished its purchasing or logistics function by outsourcing from the professional company being responsible for it, and just focuses on, for example, production. This is the way to reduce overall capital tied up at some long term investment or inventory, hence reduce the risk. But since companies are becoming more and more specialized, the information exchange is at a particular point; the inventory may overlap because the property of each product is attributed to different companies in various stages. The increased productivity calling for the efficient product life cycle turns over in a faster and faster running loop.

Supply chain management is quite likely to cause these separate functional specialists become reunified as before: the goal is shifting from outsourcing to strategic alliance in creating win-win situations for all supply chain members, so that the information can be freely exchanged. As used previously, different functional departments worked under a general management, without any obstacle, the overall productivity can be achieved.

## **2.4 SUPPLY CHAIN MANAGEMENT**

### **2.4.1 SUPPLY CHAIN MANAGEMENT IN DEFINITION**

There are various definitions about supply chain management. SCM strives to balance conflicting activities such as promotion, sales, distribution and production. SCM might be seen as a business philosophy that strives to integrate the dependent activities between firms, e.g. logistics, purchasing, production, and marketing.

Management defines logistics as: Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point-of-origin to the point-of-consumption in order to meet customers' requirements. This definition implies that logistics is a sub set of SCM.

Managing the supply chain has become a way of improving competitiveness by reducing uncertainty and enhancing customer service. The role of planning and coordination in complex integrated systems and information technology to synchronize the supply chain is described in a framework that creates the appropriate structure and installs proper controls in the enterprise and other constituents in the chain.

During the past few years, supply chain excellence, optimisation, and integration have become the focus and goal of many organizations worldwide. Strengthening the supply chain management is perceived by many firms as the way to enhancing customer satisfaction and enabling profitable growth (AMR,1997).

#### **2.4.2 IMPLEMENTING EFFECTIVE SCM STRATEGIES**

The primary purpose in establishing supply chains is to minimize the flow of raw materials and finished products at every point in the pipeline in order to enhance productivity and cost savings . The strategy covered in different aspects contributes to the overall performance.

- **Establish supplier relationships**

It is important to establish strategic partnerships with suppliers for a successful supply chain. Corporations have started to limit the number of suppliers they do business with by implementing vendor review programs. These programs strive to find suppliers with operational excellence, so the customer can determine which supplier is serving well.

With the evolution toward a sole supplier relationship, firms need information such as financial performance, gain sharing strategies, and plans for jointly designed work. They may establish a comparable culture

and also implement compatible forecasting and information technology systems. This is because their suppliers must be able to link electronically into the customer's system to obtain shipping details, production schedules and any other necessary information.

This is seen from 3PL companies in inbound processes, building relationships to suppliers (actually its customers) plays important roles in providing high quality service in satisfying both supplier and manufacturers.

- **Increase customer responsiveness**

To remain competitive, firms focus on improved supply chain efforts to enhance customer service through increased frequency of reliable product deliveries. Having a successful relationship with a supplier results in trust and the ability to be customer driven, customer intimate and customer focused .

- **Build a competitive advantage for the product oriented channel**

Achieving and maintaining competitive advantage in an industry is not an easy undertaking for a firm. Many competitive pressures force a firm to remain efficient. A competitive advantage can be supply chain management, which would help firms to implement better processes.

Attaining competitive advantage in the channel comes with top management support for decreased costs, waste management, and enhanced profits. Many firms want to push costs back to their supplier and take labour costs out of the system. These cost reducing tactics tend to increase the competitive efficiency of the entire supply chain.

- **Introduce SCM solutions and enabling information technology**

Information is vital to effectively operate the supply chain. The communication capability of an enterprise is enhanced by an information technology system. However, information system compatibility among trading partners can limit the capability to exchange information. An improved information technology system where partners in the channel have access to common databases that are updated in real-time is needed.

### **2.4.3 OUTLINE FOR ANALYSIS SCM**

This part will begin with the analysis of the supply chain framework, in order to gain a clear understanding of what a supply chain is about, its basic tenets of linking structural strategies with prescriptive strategies. Many strategists agree that firms may not be able to rely either on a price leadership role or on a differentiation strategy alone to guarantee sustained market strength. To sustain long-term growth, however,

combinations of both strategies are typically needed to operate effectively within constraints imposed by the environment.

This supply chain is made up of a manufacturer and a two-level hierarchy of suppliers. Each sub-system in the supply chain network incurs costs that are to be monitored and controlled. At each level in the supply chain, delay due to procurement activity is incurred, which has the potential of imposing waste, and thus incurring additional costs in the system.

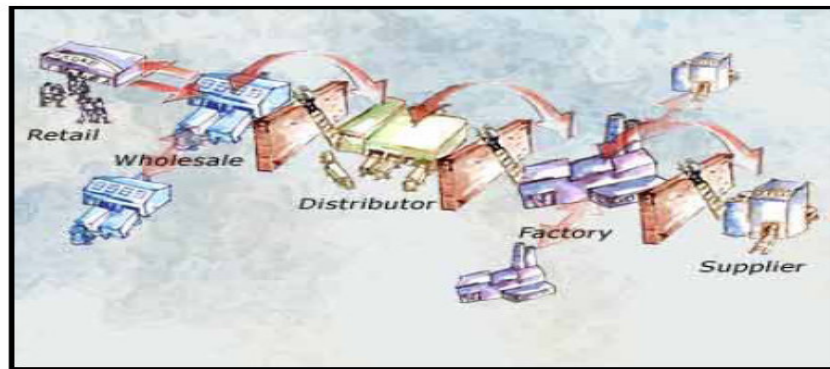


Figure 2.4 Supply Chain Barriers

(Source :Lumsen R. K., 1998)

## 2.4.4 THE SUPPLY CHAIN OBJECTIVES AND PRINCIPLES

### 2.4.4.1 Objectives

Supply chain objectives directly support its stated goals; such as a common manufacturing supply chain goal can enhance revenue through eliminating or reducing bottleneck operations in the system. Supply chain objectives that directly support this goal can be identified as:



- Increase throughput
- Reduce cycle time
- Reduce inventory at different stages (Raw materials - work-in-process - finished goods).
- Reduce overall capital tied up
- Postponed management

It is easy to realise that these objectives are complementary to each other. For example, a primary objective of increased throughput in the supply chain must be supported by a secondary objective to reduce cycle time. As a result of this improvement in the supply chain, the tertiary objective of reduced inventory at different stages, which supports both the primary and secondary objectives, can be realized, since inventory at different stages will not have to wait for the availability of operations for further processing.

Objectives can be set both at the group level for the supply chain, and at member level for individual members. However, the two sets of objectives ought to be coordinated in order to be effective performance measures for the supply chain. This may require tuning individual objectives of members so that common supply chain objectives can be met.

#### **2.4.4.2. Modeling Principles**

In general, the principles support objectives for manufacturing the supply chain. By applying these principles, out-of-control processes, inefficient logistics, and inefficiencies that are inherently present in any system, can be developed. These principles are:

- Reducing the influence of lead time variability in the productive system

The influence of lead-time can be felt in the supply chain at any stages of its life cycle. The transformation of product through various stages in its life cycle brings out various cycle time performances, such as set-up time, process time, queue time, wait time, and idle time. This is mainly accomplished by designing coordination mechanisms through sharing information in the form of demand schedules, capacity plans, production schedules, etc.

For example:

- Set-up time can be shortened by ensuring constant demand in the system.
- Process time variations can be reduced or eliminated by standardizing methods and procedures.

- Queue time can be eliminated by coordinating schedules between servers, so elapsed time for service can be minimized and server efficiency can be improved.
- Idle time can be eliminated or shortened by scheduling maintenance of productive resources.
  - Reducing the influence of inventory variability at different stages and locations in the supply chain

Inventory variability is a serious challenge in the management of a supply chain. Various types of inventories are created throughout the material transformation. Raw material production is a continuous manufacturing process, where batches are introduced in order to achieve economies of scale and production efficiencies. Decoupling stocks may also be created, if, for example, an end product of one process (unprocessed goods) and a raw material for the next process are warehoused to achieve production economies. Material flow at the next stage required producing following materials. Finally, consumers' demand patterns, product characteristics, and customer service levels dictate maintaining safety stocks to avoid stock-outs.

- Reducing the influence of batching effects variability in the productive system

This principle prescribes that the relationship between lot size and lead-time should be closely managed in a manufacturing supply chain. Two types of effects that emerge from this relationship are batching effect, and saturation effect .

**Batch Effect.** The rationale behind this effect is that an increase in lot size should also increase lead-time. For example, a batch of one unit can immediately move to the next operation as soon as the processing is complete. However, a batch of five units does not move until all five units are completed. Large batches will cause longer delays of parts waiting for the rest of the batch to be completed.

**Saturation Effect.** The principle behind this effect is that saturation effect works conversely to the batching effect. That is, when lot sizes decrease, and set-up is not reduced, lead-time will eventually increase. As a result, demand becomes a relatively larger proportion of available capacity and congestion increases.

Since the effects of the two phenomena are opposite, the aggregate behaviour of lead-time as a function of lot size assumes a convex or a U-shape. In the final analysis, however, by making the transfer batch

smaller than the production batch, production lead-time can be substantially reduced.

- Reducing the influence of variability due to bottleneck operations in the supply chain

This principle actually means, rather than balancing capacities that the flow of product through the system should be balanced, i.e., the modelling of waste management should be designed to control throughput and work-in-process inventory simultaneously. A rope in the form of feedback of information from the bottleneck operations to upstream operations enables the pipeline to maintain its throughput.

#### **2.4.4.3. Implementation of the Developing Strategy**

The supply chain management perspective enables developing interaction between production and marketing policies in the supply process of raw materials and the production of finished products. The element of coordination in developing effective strategies for a manufacturing supply chain is built by incorporating planning and control function as the integration unit.

The coordination of the end product is effected with the help of a common model that performs the planning and controlling functions of the supply chain. In this manner, common policies agreed to among various members of the supply chain are implemented. For example, it may be possible to enforce common quotas for capacities, mutually agreeing to price and cost structures, as well as production schedules, etc.

## **2.5 INBOUND LOGISTICS**

One convenient way to view the supply chain for a single company is to divide its logistics system into inbound logistics (material management and procurement) and outbound logistics (customer service and channels of distribution).

Clearly the definition of inbound logistics is a matter of perspective. If you are the receiver of a shipment, the shipment is inbound to you; if you initiate or send a shipment - as a raw materials supplier, manufacturer or vendor might do then it is outbound from you.

Seen from the supply chain perspective, it follows that the sequence for the material flow from origin to final consumption, this is a rather complex network, there are some layers of supplier and layers of

distributors, this network is centralised in one point, that is the manufacturer, also defined as OEM (Original Equipment Manufacturer).

The inbound logistics service company plans shipments for the manufacture "in" to their location, but the material supply comes from many origins.

Taking greater control of inbound logistics has become a top priority for many manufacturers and retailers as they look for cost-improvement opportunities in response to the struggling economy. Companies have historically focused on their outbound operation because it is the customer-side of the business, while control of inbound operations was generally relinquished to suppliers. It is not that outbound operations have been streamlined and extracting additional benefits have become more difficult, companies are turning their attention to inbound to not only reduce costs, but also to forge more collaborative relationships with internal groups, suppliers, and transportation carriers, which ultimately results in 'smarter' business processes that benefit all parties .

## **2.6 INVENTORY MANAGEMENT**

In theory, the best solution for a company in servicing its customers would be to locate an inventory in each facility that is closest to the customer.

There are not many companies that could afford such a luxurious

inventory commitment because the costs are discouraging. Therefore, according to the definition, the objective of the effective inventory management is to accomplish desired customer service with the minimal inventory level followed by lowest tied up capital in inventory.

### **2.6.1 OBJECTIVE AND TYPES OF INVENTORY**

Waters points out that the main purpose of inventories is to act as a buffer between supply and demand. They allow operations to continue smoothly and avoid disruptions. Waters names some other reasons for holding inventories ( Waters, D., 1996):

- To act as a buffer between different operations
- To allow for demands that are larger than expected, or at unexpected times
- To allow for deliveries that are delayed or are too small
- To take advantage of price discounts on large orders
- To buy items when price is low and expected to rise
- To buy items that are going out of production or are difficult to find
- To make full loads and reduce transport costs
- To give cover for emergencies.

There are different approaches to classifying inventories. Lumsden 2003 categorizes the inventories that are the process-based (storages,



component inventory, consumption material and work in process), the flow design-based inventories(buffer, process and transportation) and, finally, the function-based inventories which reminds us of Stock and Lambert classification. In this paper, the inventories will be described according to Stock and Lambert from a function-based point of view.

Inventories can be categorized into the following types, signifying the reasons for which they are accumulated (Stock, J. and Lambert, D., 2001):

Cycle inventory is inventory that results from the replenishment process and is required in order to meet demand under conditions of certainty that is, when the firm can predict demand and replenishment times (lead times) perfectly.

In transit inventory inventories are items that are en route from one location to another. They may be considered part of cycle inventory even though they are not available for sale and/or shipment until they arrive at the destination.

Safety or buffer stock is held in excess of cycle inventory because of uncertainty in demand or lead time. The notion is that a portion of average inventory should be devoted to cover short range variations in demand and lead time.

Speculative inventory is inventory held for reasons other than satisfying current demand. For example, materials may be purchased in volumes larger than necessary in order to receive quantity discounts, because of a forecasted price increase or material shortage, or to protect against the possibility of a strike.

Seasonal inventory is a form of speculative inventory that involves the accumulation of inventory before a season begins in order to maintain a stable labour force and stable production runs.

Dead inventory is the set of items for which no demand has been registered for some specified period of time.

## **2.6.2 INVENTORY MANAGEMENT PERFORMANCE**

To be able measure inventory management performance, inventory turnover rate will be applied. The turnover rate of the storage is defined as the number of times per year storage is turned over. According to Lumsden, there are different ways of calculating Inventory turnover rate that depend on institutional to company dependent relations (Lumsden, K., 2003).

Estimating Inventory turnover rate will be applied, which is provided by Lumsden since it covers tied up capital:

Inventory turnover :  $\text{Turnover} / \text{Tied up capital}$

### **2.6.3 INVENTORY CARRYING COSTS AND CASH FLOW**

Inventory carrying costs, the costs associated with the quantity stored, include a number of different cost components and generally represent one of the highest costs of logistics (Stock, J. and Lambert, D., 2001).

Capital costs : The company's cost of capital - the rate of return that could be realised from some other use of the money - should be used to accurately reflect the true cost involved. In companies experiencing capital rationing, the interest rate (which is the minimum rate of return on new investments) should be used as the cost of capital (Stock, J. and Lambert, D., 2001).

In order to calculate the company's total cost of capital, the calculation should cover the tied up capital during different production stages, such as safety stock, average cycle inventory and cost for inventory in transit.

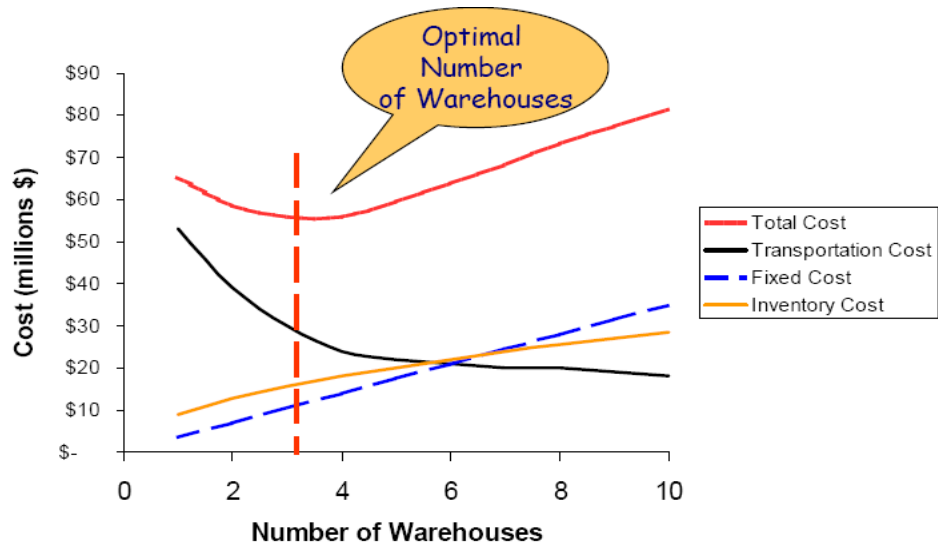


Figure 2.6 Inventory Turnover (Source : Own)

If a company receives or gives credit the tied up capital is displaced, and the inventory has not changed, but regardless of the inventory level, the tied up capital is not affected until cash flows out or in. When a company gives one month credit it has to tie up that capital for one more month. On the other hand, if the company is given one month credit and does not by itself give any credit, the capital needed is reduced by the same amount. The importance of credit time often is not valued enough. There is a good reason for a company to investigate the credit a company gives and gets ( Storhagen, N., 1997).

#### **2.6.4 INVENTORY MANAGEMENT IN UNCERTAIN MANNER**

Nowadays companies operate in rapidly changing business environment. New opening markets, altering governmental regulations, increased competition on the markets, changes in customers' buying behaviour and other macro factors affect companies' way of doing business. The issue of coping with uncertainty is important as it exists in a realistic operating environment. Uncertainty exists in the production system in many different ways.

The demand for the product and (replacement) parts is typically forecast, and as a result has a certain degree of uncertainty with respect to both the quantity demanded in a particular time period, and the timing of the quantity demanded. Literature search has been carried out about buffering against uncertainty and will introduce below one of the most common technique for decreasing insecurities in inventory management safety stock technique.

#### **2.7 THE LOGISTICAL MEASUREMENTS**

At a strategic level, logistic managers seek to achieve a previously agreed quality of customer service through state-of-the-art operating competency. The challenge is to balance service expectations and cost expenditure in a manner that achieve business profitability.

To measure the logistic effectiveness, one must be aware of the elements that affect its performance profitability. To have a full understanding of the three efficiency elements, one should not consider them as isolated parameters without any interaction among each other. For example, if one wants to reduce the cost for transportation by using full truckload, then it will keep larger volume in stock waiting for large enough shipment quantities. The final consequences are increased inventory tied up capital and decreased customer service level with lower shipment frequencies. Thus what is needed to achieve is to make a good balance among these three dimensions and optimize the total result.

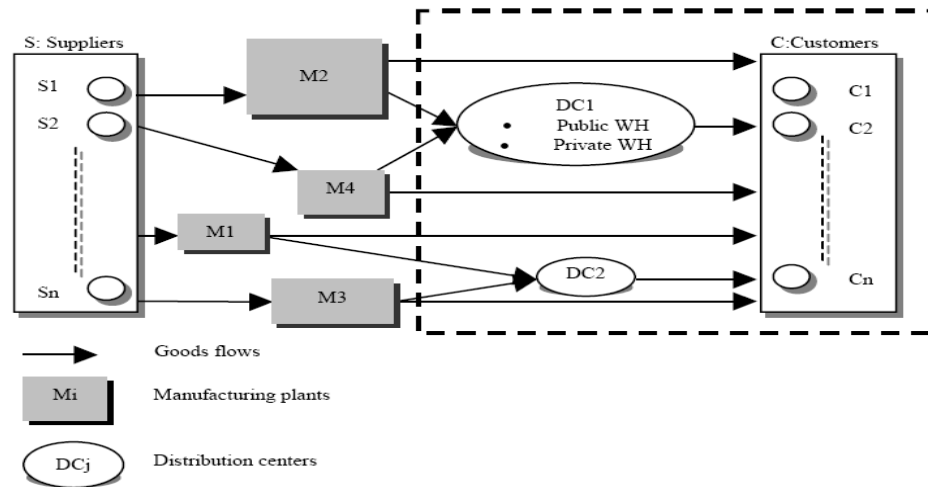


Figure 2.7 Distribution Structure of Multinational Companies

(Source : Own)

### 2.7.1 THE LOGISTICAL SERVICE

Almost any level of logistical service can be achieved if a firm is willing to commit the necessary resources. In today's environment, the limitation is the economy not technology. To the logistic service providers, the logistic service is a balance of logistic service priority and cost. Since the concept of supply chain management is targeting on improving the integral performance across the entire industry networks instead of the any single party. Thus, the key point of the logistic service control is not to do favor for only one party but to choose a suitable logistic service so that all of parties in the supply chain are better off and the overall benefit can be realized in the supply chain as well.

The traditional logistic delivery service that deals with the physical flow can according to Lumsden (1998) be evaluated in topics as follow:

- Lead-time is defined as the time from the order to the delivery.
- Delivery reliability refers to do delivery exactly at the right time that one promised.
- Delivery accuracy describes the ability to deliver the right product in the right quality and quantity.
- Storage availability describes the ability to delivery directly from the stock it also reflected by the frequency of out of stock happening.

- Flexibility refers to the ability of adjusting the delivery according to the customer desire on delivery batch size, destinations, frequencies or documentations.
- Information is about what type of information is exchanged between customer and suppliers about delivery service.

### **2.7.2 TIED UP CAPITALS AND LOGISTICS COSTS**

The capitals that are tied up in the logistic operations are mainly caused by the inventory, work in process materials and the facilities that related to product holding. The inventory tied up capitals cause capital cost. It is a kind of opportunity cost, as it cannot be used in the circulation and creates new values for the owners. Quantitatively, it equals the interest rate multiplied by the value of the inventory

The amount of capital tied up is very much related to the service level of logistics. If the logistic service provides more frequency and reliable delivery then the inventory level could be reduced, so does the inventory capital tied up. The lead time also has a direct impact on the inventory level. The shorter the planned lead-time is the lower the level of inventory.

The logistical cost happens when the logistic service providers carry out the logistic operations ( Bowersox. D. & Closs.D. 1996). It can be



breakdown into several parts including handling and maintenance cost, transportation cost and control cost. The handling and maintenance cost is the cost associating with holding inventories. It consists of ;

- Taxes: The tax cost is a direct levy based on the inventory level.
- Insurance: Insurance cost is heavily related to the estimated risk or explore time. High value products have more risks of being stolen and hazardous product that are combustibile result in relatively higher insurance cost.
- Obsolescence: refers to the deterioration of product in storage and is not covered by insurance.
- Storage: Storage cost covers facility expenses related to product holdings, such as warehouses.

Transportation cost consists of any expense that happens during moving the goods. It covers tolls, fuel cost, labour cost, the vehicle maintenance, insurance cost and etc.

Control cost is mainly the administration expenses spent on gaining control of the whole transportation operations. It consists the trucking cost, rout planning cost and any expenses of making adjustment according to changes of customer's demand.

Other logistical costs may concern the information system cost. It covers a wide area from order receipts to information management such as spending on leasing GPS (Global Positioning System) system. The type of depot network will effect many of these costs as well.

## **2.8 GAINING COMPETITIVE ADVANTAGE**

Today, it is generally accepted that the need to understand and meet customer requirements is a condition for survival. For a company to meet customers' requirements it is not possible for functions within a company to act independently of each other. Leading edge companies include supply-side issues in the development of their strategic plans. Before going into how to achieve an integrated supply chain, the concept of functional and process perspective of business processes, the total cost concept and time-based management will be explained below.

### **2.8.1 COMPETING THROUGH LOGISTICS**

Companies today can no longer act as an isolated and independent entities in competition with other similarly stand-alone organisations. In the past the ground rules for success were strong brands backed up by large advertising budgets and a selling that was aggressive. By managing their core processes better than competitors manage theirs, organisations can

create superior value for customers and consumers. The core processes include such activities as new product development, supplier development, order fulfilment, and customer management.

Stock and Lambert believe that just like a good product, promotion, and/or pricing strategy, logistics can be a source of competitive advantage for a firm. Competitors can develop competing products in a short time but logistics is difficult to duplicate. Many organisations have recognized that logistics competency holds the key to developing or maintaining continued business success (Stock, J. and Lambert, D., 2001).

The road to reach a level of the supply chain where the information is transparent is long. Not all companies reach this level, but those who have developed world-class logistics competency have the benefit of enjoying competitive advantage as result of providing important customers superior service. The literature refers to supply chain as it exists within all companies and information is shared between partners. This is far from the reality. Many companies are still struggling to streamline and adjust their activities within the company in order to reach a competitive advantage (Poirier, C., 1999).

## **2.8.2 TOTAL COST CONCEPT**

Lambert and Stock have a broad perspective on total logistics costs. Total cost analysis is the key to managing the logistics function. One of major goals of the organisation should be reducing the total costs of logistics activities rather than focusing on each activity in isolation. Reductions in one cost invariably lead to increases in the costs of other components. Effective management and real cost savings can be accomplished only by viewing logistics as an integrated system and minimising its total cost given the firm's customer service objectives.

The major cost categories are customer service, transportation, warehousing, order processing, and information, lot quantity, and inventory carrying.

### **2.8.2.1 LOGISTICS SYSTEM IN CUSTOMER SERVICE**

Customer service represents the output of the logistics system and the place component of the firm's marketing mix. It is a measure of the effectiveness of the logistics system in creating time and place utility for a product. The sum of the expenditures for such logistics activities as transportation, warehousing, order processing and information systems, production setups and purchasing, and inventory management can be viewed as the company's expenditure for customer service (Stock, J. and Lambert, D., 2001).

The best approach is to determine desired levels of customer service based on customers needs, and to consider how those needs will be affected by expenditures on the areas of the marketing mix. Because each of the other five major logistics cost elements work together to support customer service, logistics managers need good data regarding expenditures in each category ( Stock, J. and Lambert, D., 2001).

#### **2.8.2.2 WAREHOUSING COSTS**

Warehousing costs are created by warehousing and storage activities and by the plant and warehouse site selection process. Included are all of the costs that vary due to a change in the number or location of warehouses.

There is no single best approach that a firm can pursue in warehouse productivity measurement. Management action is determined by a variety of factors, such as customer service levels (e.g., shipping performance, error rates, order cycle time); inventory accuracy (e.g., correct quantities of each SKU at all warehouse locations); space utilisation (e.g., the right inventory, square foot or cube utilisation of facilities), and labour productivity (e.g., throughput rates) (Stock, J. and Lambert, D., 2001).

### **2.8.2.3 Order-Processing/Information Systems Costs**

The order processing system can affect the performance of the logistics function in two major ways. First, the system can improve the quality of the management information system by providing such data as customer names, location of customers, items demanded by customer, sales by customer, sales patterns, order size, and sales data for the company's sales forecasting package. Second, the customer order is the message that sets the logistics function in motion. The speed and quality of the information provided by the order processing system have a direct impact on the cost and efficiency of the entire logistics process. Slow and erratic communication can lead to lost customers or excessive transportation, inventory, and warehousing costs. Implementation of the latest technology in order processing can lead to significant improvements in logistics performance (Stock, J. and Lambert, D., 2001).

### **2.8.2.4 Transportation Costs**

Expenditures that support transportation can be viewed in many different ways, depending on the unit of analysis. Cost can be categorised by customer, by product line, by type of channel, by carrier, by direction (inbound versus outbound), for example. Costs vary considerably with volume of shipment, weight of shipment, distance, and points of origin

and destination. Costs and service also vary considerably with mode of transportation chosen (Stock, J. and Lambert, D., 2001) .

### **2.8.3 TIME BASED AND COST BASED MANAGEMENT**

The traditional way to improve efficiency and effectiveness within a company has been based to a large extent on cost reduction concepts and strategies. However, according to Mattsson 2000, focusing directly on time instead of on cost is quite a different approach to making companies more efficient and more competitive.

Using time-based management, companies reduce costs indirectly through compressing lead times. Faster inventory turnover and lower overhead costs are typical consequences when lead times are compressed by eliminating breakdowns, delays and various kinds of waiting times (Mattsson, S-A., 2000).

Experience gained in companies around the world has repeatedly shown that the results achieving by applying time-based management are significant.

As time is compressed:

- Costs are reduced and productivity is increased;
- Prices can be increased;

- Customer service and profitability is improved;
- Capital tied up in inventory and work-in-process is reduced;
- Quality is improved.

## **2.8.4 OVERCOMING THE INTEGRATED SUPPLY CHAIN**

Before describing the evolution of how to reach an integrated supply chain the concept of functional and process perspective has to be understood.

### **2.8.4.1 Functional Perspective**

The traditional way to organise a company is through functions due to the characteristics of activities and responsibilities. One of the main principles behind the practice of organising through functionality is from input and consumption of resources.

When a company is organised through function it is more focused on effective administrative management of the company's resources than creating value adding flow from delivery of material to the company and to delivery of product to the customer (Mattsson, S-A., 2002).



#### **2.8.4.2 Process Perspective**

Lumsden 1998 and Mattsson 2002 pinpoint what are common for processes: a process consists of activities, and the aim of the process is to create value and there is a customer who is the target for these value adding activities (Mattsson, S-A., 2002). The process appears often as cross-functional flows of part processes that overcome the gap between the functional units of an organisation. Process view creates awareness of the customer, the product, the information flow and the resource consumption and more clearly point out the efficiency of the organisation in focus (Lumsden, K., 1998).

Since a company get its income from customers by delivering products, the most practical way to organise would be through the output instead of input. This means that a company should organise its activities after products and material flow with focus on delivery to customers (Mattsson, S-A., 2002).

#### **2.8.4.3 Evaluation of Integrated Supply Chain**

The concept of supply chain management is an extension of the logic of logistics. The figure below suggests that there is in effect on evolution in integration ( Christopher, M., 1998 ).

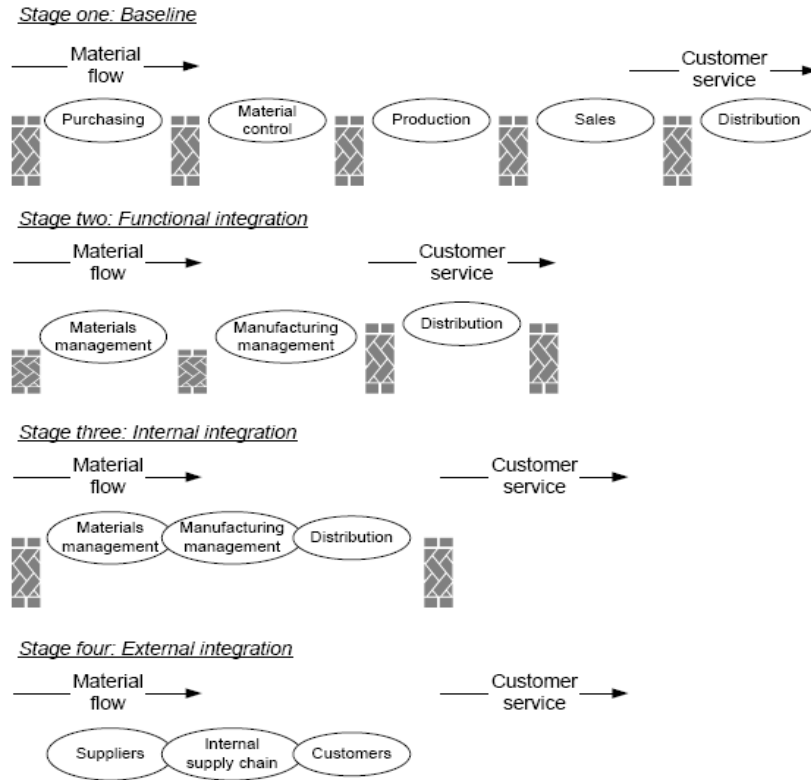


Figure 2.7 Integrated Supply Chain Achievement  
(Source: Christopher, M., 1998.)

There is an evolution of integration from stage 1 which indicates a complete functional independence where each business function does its business in complete isolation from the other business functions. A good example of this is where production seeks to optimize its unit costs of manufacturing by long production runs without regard for the build-up of finished inventory and does not take notice of the impact it will have on the need for warehousing space and the impact on working capital (Christopher, M., 1998).

In stage 2 companies have recognized the need for at least a limited degree of integration between closest functions, like distribution and inventory management or purchasing and materials control. From stage 2 it is a natural next step to stage 3. This, however, requires the establishment and implementation of an end-to-end planning framework. Stage 4 represents true supply chain integration in that the concept of linkage and co-ordination that is achieved in stage 3 is now extended to suppliers and to customers. Again it should be pointed out that logistics management is concerned with a planning coordination and framework that seeks to create a single plan for the flow of product and information through business. The supply chain management builds upon this framework and seeks to achieve linkage and co-ordination between processes that take place between customers and suppliers and the organisation itself.

According to Mattsson 2002, every barrier between individuals, departments and organisations requires more time and lead times become longer. Therefore a natural way to have more effective business processes is to reorganise with a fusion of performance and responsibility for different activities and sub processes between different departments within the company so that the number of borders are reduced. To organise in a more effective way could also take place between companies (Mattsson, S-A., 2002).

## **CHAPTER 3 CASE STUDY**

### **3.1 CASE STUDY OF REYSAS LOGISTICS A.S.**

#### **3.1.1 ABOUT THE COMPANY**

In this study, to forecast the effects of EU membership on the Turkey's economy with the projection of the case studies. The core businesses of Reysas Transportation & Logistics (Reysas Tasimacilik ve Lojistik A.S.), a Company of Reysas Group, are to carry on the transportation activities with all kinds of means, including land, maritime and air vehicles, leasing the purchased vehicles, to provide merchant and passenger transportation through rented vehicles, to make the agency and dealership of transportation means, to carry the trade of transportation means, to keep the road vehicles in maintenance and repair, to buy, sell, distribute, stock and to serve as an agency of oil and oil products, to set up filling stations, to carry the inland and overseas transportation activities of oil, fuel and all their products.

Reysas Transportation & Logistics tenders of services to many domestic and foreign companies, which the customer's portfolio is composed of PO, Toyota, P&G, Saka Su, D&R, Hayat Kimya, Pinar, Cargill, Pepsi Cola, Philip Morris, Mey Icki, Ford Otosan, Karsan, Peugeot, Texaco, Tofas, Skoda, Total, Arcelik, Opel, Saab, Chevrolet, Efes Pilsen, Temsa

Mitsubishi, Kavaklıdere Sarapları, Copikas and GıdaSa. Besides, every day the Company implements the dispatching activity of fuel, LPG and lube oil, which totally reaches approximately to 5 million liters, with its own vehicles.

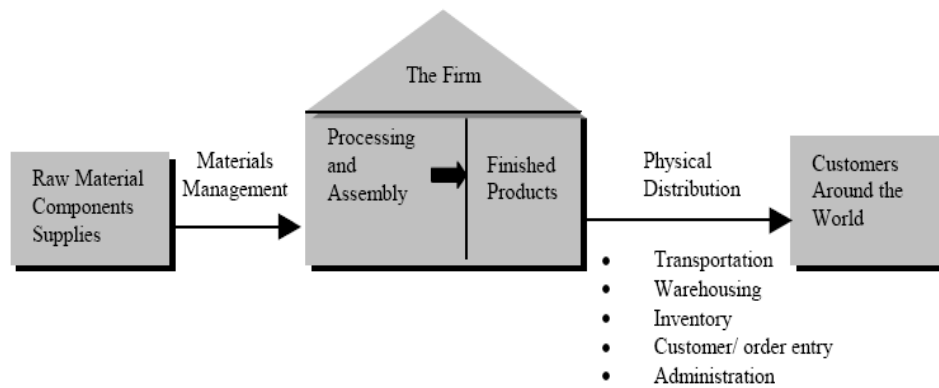


Figure 3.1 Global Logistics

(Source : Wood et al ,1995)

The Company's capacity of vehicle transportation is over 375 thousand and it also carries on the distribution of spare parts to some auto dealers. The Company gives services to Czech Republic, Hungary, France, Romania and Poland, with a goal of extending the transport network route also to Great Britain.

### 3.1.2 LOGISTICS SECTOR AT GLANCE

The primary purposes in logistics sector are the minimal stock, the minimal cost, high quality, to be able to monitor, and sustainability. The companies should make crucial investments and long-term agreements to serve better in logistics. Furthermore, the geographical position of countries is considerable for the sector to progress. Accordingly, Turkey is geographically lucky.

Sector displays activity that is reasonably lower than its capacity. The rate of logistics sector to GDP in developed countries reaches to 17%, while this rate is only 1-1,5% in Turkey. This actually gives a net clue about the sector's potential. Moreover, the EU membership process appears as an advantage for the logistic sector to progress and this process highlights the financially strong firms, such as Reysas.

Investments	January 01, 2006(TRY)	June 30,2006(TRY)
Land	24.410.786	44.785.168
Land Improvements	12.218	12.218
Buildings	21.132.136	21.175.406
Machinery, Plant & Equipment	1.512.450	1.713.252
Motor Vehicles	97.614.572	109.784.904
Furniture and Fixtures	2.327.272	2.457.085
Other Tangible Fixed Assets	590.517	590.517
Investment in Process	865.999	9.740.145
<b>Total (Except depreciation)</b>	<b>148.465.950</b>	<b>190.258.695</b>

The Company that had 60,500 square meters storage area , continues to extend this capacity by buying lands located in Tuzla and Eskisehir. At the same time, Reysas has increased largely its fleet of vehicles and has a 4-year-long railway inland wagon transportation agreement with TCDD (Turkish State Railways). In parallel to this, the Company has increased the wagon capacity and bought a piece of land in Kocaeli to be used as a base in railway transportation.

To be active in maritime transportation, Reysas has established a new limited company called as Reymar Denizcilik Sanayi ve Ticaret LTD. with a 99% participation and simultaneously a company to provide for the needs in Russia with a 100% stake.

### 3.1.3 FINANCIAL DATAS

Reysas with two significant business lines that are mainly logistics and transportation, actualizes 70% of its revenue from the logistics department which covers carriage, ensuring supply, inventory management and warehousing.

Financial Datas (TRY)	6M2006	3M2006	12M2005
Net sales	80,106,910	35,523,648	136,801,018
Gross Profit Margin	8%	12%	12%
Operating Profit/Loss	2,217,258	914,408	10,117,547
Net profit/Loss	(4,458,375)	1,013,698	7,758,136
Financial Debt			
Burden	45%	32%	38%
Net FX Position	-31,166,290 (6M2006 financial datas)		

The first half of 2006 financial statements have manifested that despite the increase in revenue by 22%, the profit margin has reduced from 0,11 to 0,08 because of the 25% increase in costs. Stemming from the increase in operating expenses by 24%, the Company has generated TRY 2,2 million operating profit and the financial expenses has reached up to 11 million from 2,4 million in TRY terms with increased investments. The Company has used FX bank loans (with TRY 5,5 million of interest expenses) to finance the investments and beared the expenses of exchange difference that has come after the 20% appreciation in FX rates during March-June period. The Company, with its stocks trading at TRY 2,05 BV, has announced TRY 4,4 million loss in its 1H06 financial statement which has occurred because of the pressure of financial expenses, while the amount of profit that has been announced to taxation authority in 9M05 was TRY 462,487.

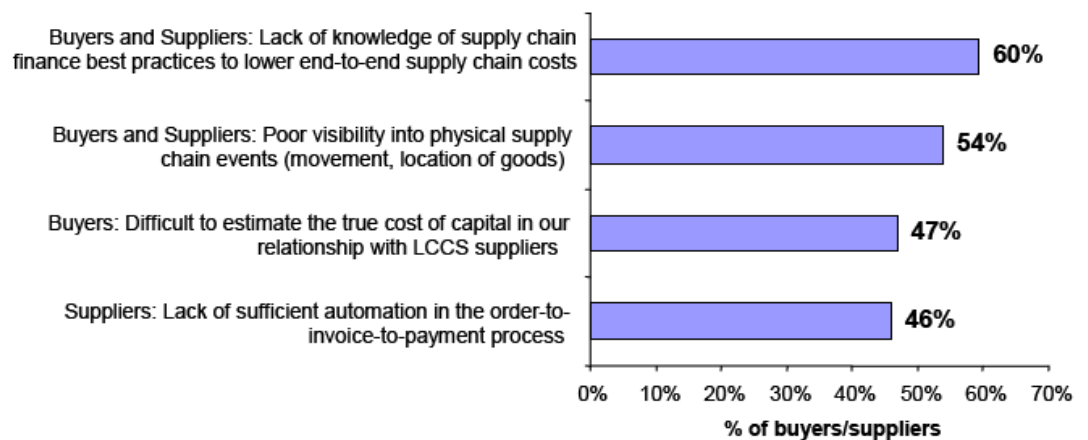


Figure 3.2 Supply Chain Financial Challenges

(Source : Aberdeen group , November 2006 )

With depreciation of FX rates in the second half, there would be a reduction in financial expenses and by the way, a correction would be occurred in



financial statements of the Company. In addition, when the investments would be completed, the profitability of the Company would increase with the possible increase in profit margin.

## **3.2 CASE STUDY SAAB AUTOMOBILE AB**

### **3.2.1 COMPANY PROFILE**

The manufacturing plant of Saab Automobile AB is located at Sweden. Saab Automobile AB is active in many countries worldwide. The most important markets are: USA, United Kingdom, Sweden, Germany, Italy, Australia, France, Netherlands and Norway. The company has experienced turbulent financial crisis during the past several years. Nowadays, Saab Automobile AB is fully owned by Saab Cars USA Inc. The overall manufacturing and financial capacity start to become better since last year.

### **3.2.2 Logistics Strategy in Saab Automobile AB**

The key distribution objective of Saab Automobile AB is to achieve high performance on reliability, flexibility, lead-time, and efficiency. The company is trying to operate with low tied up capital and efficient distribution in the whole supply chain, without compromising on the customer satisfaction targets and without losing sales opportunities.

### **3.2.3 CURRENT SUPPLY DISTRIBUTION STRUCTURE OF SAAB AUTOMOBILE AB**

The manufacturing structure is closely integrated with its logistics structure in Saab Automobile AB. The company has daily departure (scheduled traffic) from the factory .

For the dealers in Sweden, England and Argentina, the company has shuttle services. The main transportation modes for Saab Automobile AB are water and road. Saab Automobile AB uses scheduled transportation of vessels; it informs the shipping company the capacity it needs every morning, so the shipping company can properly arrange other cargos. Saab Automobile AB has railway transportation as well, while it counts for a very small percentage and the delivery performance is poor.

Saab Automobile AB always uses transportation companies, and it has quite strong requirements to the third party logistics service providers. For instance, the transporters must fulfill just in time (JIT) requirement.

### **3.2.4 REGIONAL LOGISTICS INFRASTRUCTURE**

From the company's point of view, there are not too many problems with the current infrastructure. The major development that the company wants is to develop the railway transportation system.

The current infrastructure affects the development of new logistics solutions as well as the environmental performance of the companies.

All my respondents agree that logistics is an effective way to achieve competitive advantages and this role will possibly continue in the fast changing global marketplace. Logistics has a great contribution to minimizing the costs all through the value chain. However, the applications of logistics in companies' operations vary greatly dependent on different industries, competitive conditions, customer pattern, product characteristics and economic situations.

The automotive industry is one of the leading industries that realize and highlight the importance of logistics. In automotive companies such as in Saab Automobile AB , logistics is not just a way of competition, but also an effective and necessary method to achieve good performance of production. As one key part of the manufacturing process, logistics is highly integrated in the manufacturing processes of

companies; in this way companies might perform just in time (JIT) production. The raw materials, semi-finished products, and spare parts are all transported on JIT basis, so are the finished products. In the manufacturing plants of Saab Automobile AB, a truck comes to transport finished cars to other terminals every thirty minutes. The whole supply and distribution chain is running all the time. The reason behind this could be traced to the product characteristics and cost considerations for warehouse and inventory.

For most of the companies, time keeping is becoming more and more important. Time keeping requires that the goods flow to their destination in a just in time (JIT) manner, through which companies may decrease their warehouse spaces, and save the costs for storages. The goods should be delivered neither early nor late. When it is early deliveries, customers might not have space for storing the goods, late deliveries might delay customers' production or operation.

Time keeping also concerns the material flow within the companies' border, and the distribution of finished goods to consumers. In both production and distribution, Saab Automobile AB strongly requires the JIT transportation. It has no warehouses for raw materials and semi-finished products that are used in the production as well as the finished cars. The incoming materials will be directly put into

production, and the finished cars will be delivered right away after they came out of the production lines.

### **3.3 DATA ANALYSIS AND EVALUATION**

Companies may use logistics to achieve cost advantages, differentiation advantages or both. Even though recent studies put a lot of emphasis on the factors e.g., customer relations, product characteristics when developing a logistics strategy. It still dominates or affects companies' strategies to a very large extent. And it is closely relate to the companies' competitive advantages.

- There is a crucial growth potential in logistics sector and the Company is one of the leading logistics and transportation companies in Turkey;
- Taking into consideration the EU membership process, when compared to the others in the sector, the Company has many advantageous such as high quality standards, young age of fleet of vehicles, strong financial base, crucial investments and prosperous profile;
- In spite of the pressure on costs and by the way on profit margins, stemming from the increase in investments, there is a possibility of correction in margins when the investments would be completed as anticipated;
- In the coming periods, the railway and warehousing investments would have a positive contribution on the Company's profitability;

- Consequently, since Reysas stocks are technically being traded at discount, according to our valuation there is an upside potential of 18% from current levels in short and medium term, while in the long term it offers 40% upside potential.

## **CHAPTER 4 ANALYSIS OF THE DATA**

### **4.1 CURRENT SITUATION IN LOGISTICS**

Many firms historically managed logistics as if it were a necessary evil. (Johnson and Berger, 1977) However, In the past decade the business environment has changed dramatically. The world has become a small and very dynamic marketplace. Organisations today confront new markets, new competition and increasing customer expectations. This has put a tremendous demand on manufacturers to; Lower total costs in the complete supply chain,

- Shorten throughput times,
- Reduce stock to a minimum,
- Enlarge product assortment,
- Improve product quality,
- Provide more reliable delivery dates and higher service to the customer,
- Efficiently coordinate global demand, supply and production.

Thus, today's organisations have to constantly re-engineer their business practices and procedures to be increasingly responsive to customers and competition.

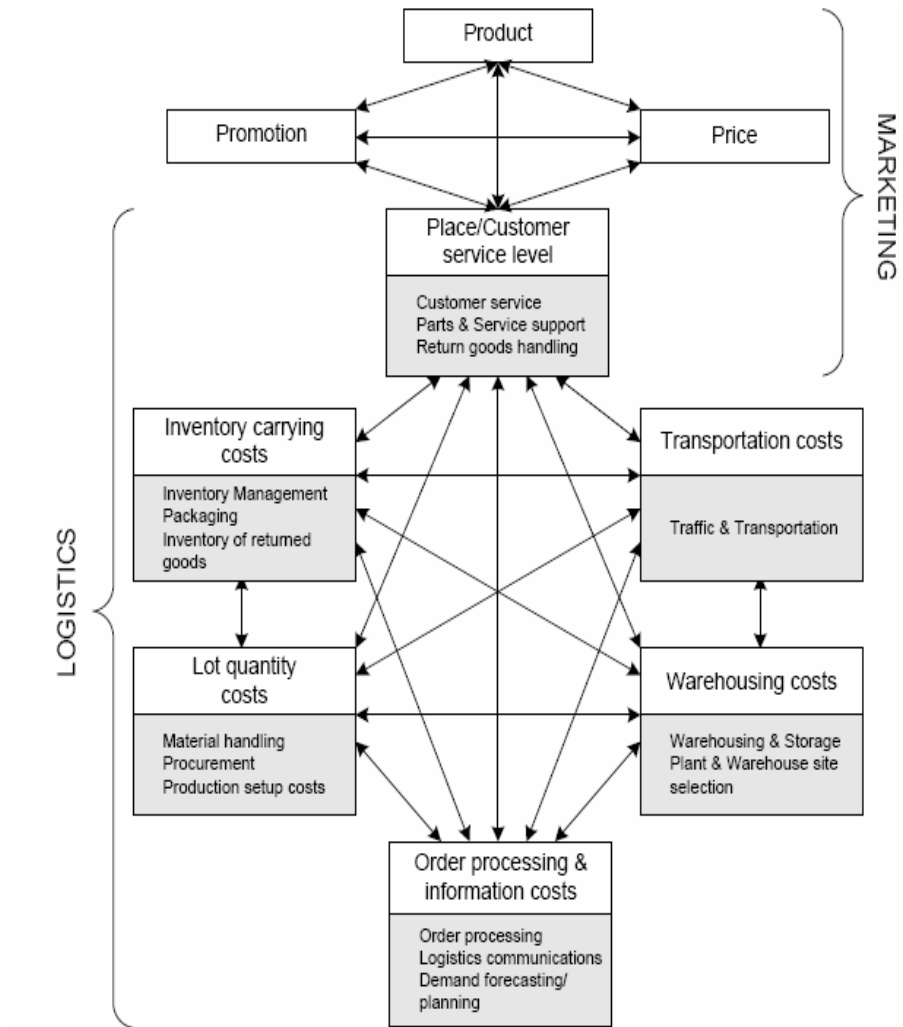


Figure 4.1 Logistics in the Economy

(Source: Stock , J. and Lambert ,D., 2001)



## **4.2 LOCATION DETERMINANTS IN LOGISTICS**

MNCs today must customize their products as late as possible in the supply chain so as to react quickly to market demands. They have to shift their capital investment as well as production and distribution sites to where labor is cheaper or more skilled, according to specific demands at the time.

The location determinants of manufacturing plants vary greatly in MNCs. Companies have different emphasis in each variable group dependent on companies' specific conditions, factors of productions, and different regional and national characteristics. The objective is to achieve best economies of scale, high flexibility of production, optimization of the cross border transport and administration costs, balancing with the considerations of the dynamics of supply capabilities, import barriers and /or export incentive, the behavior of competitors, and the companies' own experiences.

Particularly, the role of regional logistics infrastructure is highlighted by all the MNCs. Infrastructure affects the development of national/regional based distribution centers, especially when companies are operating in a global context. The physical structures and conditions of the logistics infrastructure differ greatly among countries. It is important to be aware of the differences of logistics infrastructure exist between Europe , Turkey and other countries. Advanced infrastructure may facilitate a firm's production and distribution activities and it may have positive impacts on the cost and efficiency.

#### **4.3 SUPPLY AND DISTRIBUTION STRUCTURE**

The global manufacturing has increased the complexity of firms' supply and distribution structure. Firms today hardly operate independently rather in an integral chain of operation, which involves different actors such as suppliers, forwarders, consumers/customers etc. Companies are mostly involved in more than one supply chain; the optimization of those supply chains is of great importance in the design of supply and distribution structure. For MNCs, the optimization is closely related to firms' manufacturing plant location decisions.

<b>Buyers</b>	<b>%</b>	<b>Suppliers</b>	<b>%</b>
Program to extend payment terms	<b>49%</b>	Extended payment terms for our buyer	<b>46%</b>
Early payment discount program offered by your company	<b>40%</b>	Early payment discount program offered by the buyer	<b>29%</b>
Buyer-financed raw materials for LCCS suppliers	<b>17%</b>	Factoring of confirmed receivables/ letters of credit (LCs)	<b>25%</b>
Buyer-financed work-in-progress for LCCS suppliers	<b>13%</b>	Credit insurance to mitigate Buyer's inability to pay	<b>21%</b>
3rd party financing of vendor-managed inventory	<b>10%</b>	Inventory/ production loan from a financial institution	<b>17%</b>

Table 4.2 Common Supply Chain Finance Applications

(Source : Aberdeen Group ,November 2006)

Two factors should be highlighted in the optimization process e.g., cost considerations and efficiency. Other factors e.g., national resource conditions such as access to raw materials, energy, and skilled labor;labor cost etc, investment capital and governmental regulations are also crucial for the optimization process. The selection or combination among the different types of structures for MNCs is a balance of cost, efficiency with regard to plant locations, product characteristics, main actors and activities involved and regulations.

## **4.4 LOGISTICS STRATEGY IN EU PROCESS**

### **4.4.1 THE STRATEGY**

Strategy is defined as follows:

"Strategy is the direction and scope of an organisation for long term, which achieves advantage for the organisation through its configuration or resources with a changing environment and to fulfil stakeholders' expectations( Johnson, G. and Scholes, K., 2002)."

The way that companies achieve competitive advantages is shifting from product-based concept to service-based concept. In 1980's and early 90's, companies tended to achieve competitive advantage more through product-based concept e.g., decreasing the product costs including material cost, capital, direct labor, indirect labor, energy and management cost etc; producing the products with differentiated design, functions etc that competitors didn't have or couldn't easily imitate.

Nowadays, there is an increased number of companies to achieve competitive advantages through service based concept. More and more attentions are paid to decrease the cost of logistics services to the customers/consumers, while increasing the quality of the services e.g.,

timeliness, flexibility, fast response, and high availability. In the manufacturing industry, the focus is now on improving the performance of logistics all through the value chain, which is regarded as the key part in this service-based concept. This shift has significantly increased the importance of firms' logistics strategy. Companies have to adjust their strategic development in relation to the new situations.

Many empirical studies have been done to explore the impacts of logistics in reducing the costs in value chain. Logistics strategy appears to be a combination of two major competitive strategies: low cost strategy and differentiation strategy.

Even though many companies have noticed the importance of logistics strategy, it is still difficult for them to benchmark logistics strategy with other types of strategies e.g., corporate strategy, business strategy and functional strategy. The main argument focuses on in which level e.g., corporate, business or functional level a company should perceive logistics strategy. Traditionally, logistics strategy is defined as functional strategy that enables a firm's production strategy. Logistics strategy is no longer solely a functional strategy, it should be considered at the level

of business or even corporate level for some companies such as forwarding companies.

Logistics strategy penetrates almost all the processes in the value chain. From the inbound logistics to outbound logistics, logistics strategy is the guideline for a company's logistics activities and it has strong interdependency with the actors and activities involved, in particular when a company's value chain extends into international context.

From business point of view, logistics strategy now concerns how a firm should compete within a certain industry or market. The success and implementation of a firm's logistics strategy requires the supports from several individual business functions such as production, research and development , marketing, human resources and finance.

#### **4.4.2 THE PLAN AND LEVELS**

Mission statements provide the foundation from which the firm develops strategies and plans. As corporate mission statements serve to provide the starting point for developing corporate goals and objectives, the logistics statements will provide direction for developing business strategies. The components of a corporate mission statement or logistics

mission statement are only one element of a firm's total corporate mission (Stock, J. and Lambert, D., 2001). Corporate-level strategy is concerned with the purpose and scope of the organisation and how value will be added to the different business units of the organisation (Johnson, G. and Scholes, K., 2002) .

Business unit strategy is about how to compete successfully in particular markets. This concerns how advantage over competitors can be achieved; what new opportunities can be identified or created in markets; which products or services should be developed in which markets; and the extent to which these meet customer needs in such way as to achieve the objectives of the organisation. Strategic business unit (SBU) is a part of an organisation for which there is a separate external market for goods or services that is different from another SBU. Because of this separate external market there is a need for different strategies ( Johnson, G. and Scholes, K., 2002 ).

Operational strategies are concerned with how the component parts of an organisation deliver effectively the corporate- and business-level strategies in terms of resources, processes and people. In most companies, successful businesses strategies depend to a large extent on decisions that are taken, or activities that occur at the operational level. The integration of operational

decisions and strategy is therefore of great importance ( Johnson, G. and Scholes, K., 2002 ).

#### **4.4.3 THE PRIORITY AREAS OF EUROPEAN LOGISTICS POLICY**

- Infrastructure – Seamless systems require investments
- Research ,development and training – Strengthen the competitiveness of the European Union
- Enterpricess – The reinforcement logistics industry
- Regulation – Innovative and intelligent
- Cost efficiency – Effective logistics
- Sustainability – A must modern in logistics
- Co-operation – A strategic issue in network society
- Public private partnership – Agile solutions for investments

#### **4.4.4 LOGISTICS STRATEGIC PLANNING**

Logistics strategic planning has been defined as follows:

"Unified, comprehensive, and integrated planning process to achieve competitive advantage through increased value and customer service, which results in superior customer satisfaction , by anticipating future demand for logistics services and managing the re- sources of the entire



supply chain (how to go there). This planning is done within the context of the overall business goals and plan (Stock, J. and Lambert, D., 2001)."

When overall corporate strategies and marketing plans have been determined, the logistics planner must evaluate the basic alternatives and recommend the system configuration that satisfies customer needs at the lowest total cost. The process must begin with identifying and documenting customer service goals and strategies. Management can use a customer service survey to determine the needs and requirements of the firm's customers. The plan must consider the specific requirements of customers, competitive service levels, changing environmental conditions, and the amount of service that the firm is willing to offer ( Stock, J. and Lambert, D., 2001). It is not possible to design an efficient and effective logistics system without first establishing the firm's customer service objectives.

## **CHAPTER 5 CONCLUSION**

### **5.1 BACKGROUND PICTURE**

Logistics is increasingly being a popular word for companies. It was not so long ago that some companies did not know this term; it was transportation, it was warehousing, and it was the bundle of routines that has to be done. Even today, there are many companies, which could not understand the importance of logistics yet. Eventually, they will have to see the opportunities that can be obtained via efficient logistics management, or they will not be able to survive in the fierce market conditions of our decade.

There are differences in the perception of logistics between different countries. Logistics developed in phases, and developed countries are ahead of the developing ones. However, the gap between different countries is decreasing rapidly. Even changing human resources advertisements in Turkey, support this trend, seeking supply chain managers with excellent skills and multi-language capabilities with at least five years experience

## 5.2 DEVELOPING NEW TECHNOLOGY

When developing a Supply Chain strategy, it should begin by evaluating how the links in a supply chain fit together. Supply Chain Management (SCM) does not so much require the employment of a specific technology or solution as it demands an understanding of the business processes that must work together.

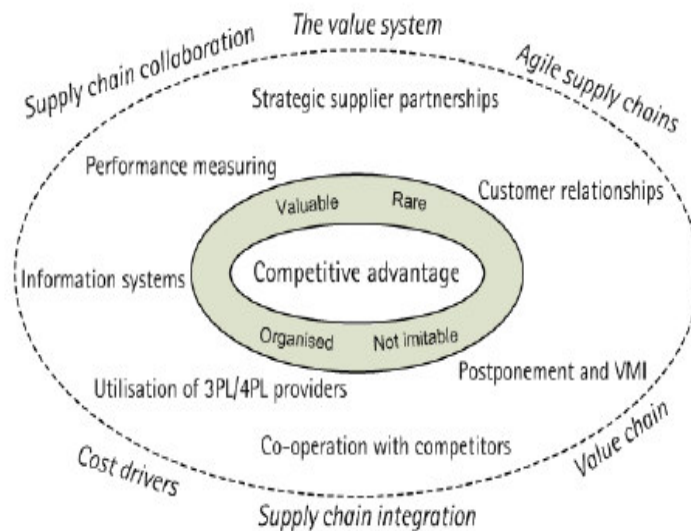


Figure 5.1 Supply Chain Optimization (Source: Own)

### 5.2.1 PRESENTING INFORMATION VISIBILITY

Most likely, SCM solution will typically include, for example, material sourcing, forecasting, warehousing, inventory planning, transportation, purchasing, and financials. Information visibility will help companies to include more dynamic, collaborative communication networks in their offerings, giving birth to collaborative commerce and helping to improve communication beyond the transactional supply chain.

### **5.2.2 BENEFITS SHARING**

Sharing benefits is an important success factor for many companies. Although there are a lot of challenges to the implementation, the gains to be realized with the supply chain outweigh the concerns and hence more and more organizations are moving towards automating their supply chain. The benefits should be equally shared within supply chain members, it is not good to sacrifice others benefit for gaining more, and this kind of relationship will not last long.

The global logistics strategy appears when a firm expands its activities from domestic context into international context. The difficulty and complexity of the international good flows and transactions have made global logistics strategy one of the key factors that determine a global firm's

success. Effective implemented global integrated logistics strategy differentiates MNCs from their competitors through improved customer service for instance in the case study Reysas Logistics A.S. Therefore, the global perspective in the development of logistics strategy has to be highlighted.

### **5.3 DEVELOPMENTS IN THE BUSINESS ENVIRONMENT**

In the past decade, the business environment has changed dramatically. The world has become a small and very dynamic marketplace. Organisations today confront new markets, new competition and increasing customer expectations. (Shankarnarayanan, 1999)

Total customer value is the bundle of the benefits the customer expects from a given product or service. For this reason, competition is not between what companies produce in their factories but between what they add to their factory output in the form of packaging, services, customer advice, delivery arrangements, warehousing and other features that people value. Relying on product attributes as a means of attracting and retaining customers is found to be insufficient and logistics is applied as one of the key business processes in delivering value and quality to the customer and in gaining a competitive advantage. Logistics has been identified as having the potential

to become the next governing element of corporate strategy to create value for customers, generate cost savings, enforce discipline on marketing and extend production flexibility. (Ulengin and Uray, 1999)

Information technology (IT) is an ill-defined term covering a wide area of technological applications including microelectronics, data processing, robotics, communications, sensor applications and software packages. The common element linking these applications is the opportunity to improve information flows resulting from data capture and data analysis. This opportunity makes IT important to logistics.

Changing conditions in the business environment also increasing the trend for establishing alliances for the ultimate aim: satisfaction of the customer. Mergers, joint ventures, partnerships, alliances became very normal news in this decade. Vertical integration era, where companies perform every single business function themselves, has ended long time ago. Companies are specializing in their core competencies, where they can add value, and leave all other functions to others that can perform better.

#### **5.4 NEW INSIGHTS**

Logistics strategy is absolutely a weapon of competition for MNCs. It

might act as two sources of competitive advantage: cost advantages and differentiation advantages. Environmental considerations are of great importance in today's global firms' logistics strategy, while it is strongly limited by the insufficient logistics infrastructure. There is a strong need for MNCs to further develop this issue.

The use of third party logistics service providers is a very important component in a lot of companies' distribution structures and it could also be an important part in many companies' logistics strategies. The physical structure of distribution networks varies greatly between companies. However, certain similarities could be found regarding the key actors involved, and the main principles used in the designing process. Most importantly, the developments of the current distribution structure in those companies have basically the same direction. That is to establish centralized warehouses on a regional, national or international basis, while decreasing the number of different kinds of local distribution centers (DC).

## **5.5 TRENDS OF LOGISTICS REQUIREMENTS**

Shippers are demanding that logistics service providers (LSP) support their increasingly complex business processes, to enable them to improve supply

chain performance even as fragmentation of supply chains and resulting coordination requirements escalate. Shippers are requiring their logistics service providers to provide:

- ***Enhanced Traditional Logistics Capabilities:*** As shippers have sought to reduce supply chain inventories, they have demanded smaller, more frequent shipments. At the same time, channel complexity has increased requiring shipments to a greater number of destinations. On the information side, as IT has advanced it has become possible to measure logistics performance; lead time reliability and on-time delivery. Shippers are also asking LSPs to optimize transportation mode based on required delivery date/time – to trade off cost and service in selecting, for example, whether to ship by one-day or two-day air. Finally shippers have demanded and received vastly improved tracking and tracing capabilities.

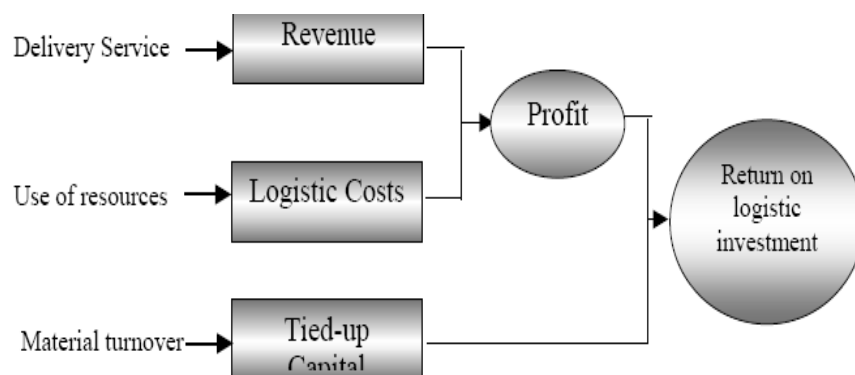




Figure 5.2 Logistics Efficiency Elements and Return

(Source :Lumsen R. K., 1998)

- ***Additional Activities.*** Enhanced IT has greatly expanded the possibilities for changing the assignment of activities to the various supply chain entities and locations. As shippers seek to streamline physical, financial and information flows, reassignment of non-traditional activities to LSPs, who are already handling products and information, is a natural solution. Alternatively, LSPs may take on additional activities at their sites or at new sites at ports, outsourced warehouses and/or sorting points. The LSP may be asked to act as a “local agent”, with a full range of materials management responsibilities, possibly including order processing, procurement, and order fulfillment. Last, the LSP may be asked to take on some parts of financial processes, such as invoicing, credit checks, and collection.
- ***Integration and Coordination of Activities.*** As supply chains have become more fragmented, integration and coordination requirements have increased. Shippers are looking for outside help in this area, either from LSPs or from other supply chain entities. Two main issues concern shippers. First, there is a need for leadership in assembling an understanding of the requirements of the shipper’s supply chain,

together with the knowledge of service providing capabilities, and application of this knowledge to develop innovative solutions. Second, there is a need for integration and management of the activities of various service providers to implement and execute solutions. This may also include provision of leadership in IT solutions.

- ***Dynamic Reconfiguration of Activities and Networks.*** As capabilities improve, shippers are moving towards more dynamic business structures. Shippers are requiring LSPs to redefine the nature and location of activities more frequently, as the rate of new product introduction increases and as channel structures become more fluid. Additionally, shippers who use networks of subcontract manufacturers (eg apparel, consumer products, and high tech products) are adapting location of manufacturing based on changing economics, capacity availability and geographic distribution of demand. (Kopczak, 1999)

## **5.6 E-SUPPLY CHAIN**

The “e-Economy” poses tremendous opportunities and challenges for supply chain management. It also offers industrial and consumer products companies the opportunity to create substantial economic value for their shareholders with supply chain management at the heart of that value creation. (Copacino, 1999)

In line with the changes in IT and globalisation, there is a trend in some companies towards becoming virtual businesses. A company moving towards a virtual business model –so called E-commerce- needs providers to operate global business functions for them. A virtual business needs more functions supported by its outsourcers than ordinary warehousing or transportation, including: (Bell, 1998)

- ***Order taking.*** Customers can place orders either at the virtual business Web site or by calling a toll-free number. Web orders are sent electronically to the logistics outsourcer for fulfilment; the logistics outsourcer's call centre answers toll-free calls and submits orders.
- ***Build-to-order, repairs and returns processing.*** Outsourcers build products to order from components stored in their warehouses, or those of another outsourcer, to meet customers' specific needs. Requests for returns or repairs- whether transmitted via Web site or phone- are handled by a logistics outsourcer, who arranges for pickup, brings the product to its repair facility and redelivers the repaired unit to the customer.

- ***Global supply chain infrastructure.*** Virtual businesses can be supported by entire end-to-end supply chain systems that will be operated by virtual logistics outsourcers, similar to networks already in place at Federal Express or Emery Worldwide for moving packages. Partner businesses will tie into the outsourcers to support the virtual business through Internet connections.
- ***Order fulfilment.*** A logistics outsourcer will pass the order to its inventory-management and transportation systems for global delivery from the nearest outsourcer warehouse. All transportation and inventory will be managed for the virtual business by other outsourcers. Warehouse replenishment orders are sent daily to the contracted manufacturer on behalf of the virtual business.

## **5.7 ACTIVITIES**

The activities for companies in EU process are separated into two groups: strategic and operational.

**Strategic:**

- Clarify the logistics objectives according to corporate strategy.
- Decide what kind of supply chain seeks to be a member of and formulate a strategy for how to accomplish this task.
- Work out inventory strategy according to logistics strategy.
- Identify core processes and redesign the company around processes.
- Formulate criteria of value-adding activities and examine all activities of processes in value adding context.
- Use the Total cost concept for evaluation and decision-making process regarding changes in company's logistics system.
- Redesign the process in order to generate real time demand in order to reduce uncertainty for demand.
- Establish or improve relations with strategic suppliers in order to reduce uncertainty from suppliers' side.
- Investigate further possibilities for standardisation of components.
- Improve internal integration between departments.

**Operational:**

- Carry out suppliers' evaluation in terms of their performance (quality, timing and willingness for cooperation).
- Constantly inspect type and quantity of articles in safety stock.

- Revise the duties of Zone Manager in order to decrease lead times.
- Improve quality of the installation process in order to avoid rework (non value adding time).
- Investigate the possibility of decreasing purchasing material order sizes.
- Improve communication channels between the Zone Manager in order to decrease the time of document transmission within the process.
- Put efforts into eliminating unplanned articles buying by installation team since the invoices for those articles have a tendency to delay the total internal invoicing process.

## **APPENDIX A REYSAS LOGISTICS A.S.**

Reysas was founded in 1990 with its head office in Ankara, and has started its commercial operations with a limited number of trucks, rented vehicles, a limited number of personnel and within the scope of limited fields of activities. As of today, the number of vehicles transported by Reysas has reached millions; and the company is continuing its operations both in Turkey and abroad, with more than 1500 vehicles (excluding the vehicles employed in special operations conducted abroad)..

Reysas has started providing its services in the logistics sector, in the areas of Vehicle Transportation, Logistics, International Transportation, Fuel Transportation, Forwarding and Warehousing in 1994. During this period, Reysas extended its operations in international cargo transportation, and began providing its services in an area that included all the territories from The Netherlands to Kazakhstan.

The numbers of operations achieved by the end of 1994 have exceeded 3000. Reysas Transportation and Logistics boasts the operations center of an extensive transport network from the Balkans to the Middle East, from the Turkic Republics to the Caucasus and Europe.

As a firm that grants top priority to technological investments, Reysaş is acknowledged as the first company that has employed satellite systems in the monitoring of vehicles. Through the satellite systems employed in cargo transportation, it is possible to communicate with the drivers in writing through electronic media, and accordingly, the data relating to shipments, distances and costs can be determined through computers.

Warehouse management services are provided to the clients in frigorific and textile warehouses equipped with high technology equipment consisting of barcodes and RF (radio frequency) systems. In automotive industry, while JIT (Just In Time) distribution and accumulation services are realized, transfer of information is provided to the customers and the suppliers of the customers in electronic media through internet based applications (Oplog-Optimization Logistics), maximum capacity utilization and performance is ensured through vehicle/load optimization.

In addition to this, the performance of the driver, loading and discharge periods are monitored by using the driver monitoring system (Poliroute). The official headquarters of Reysaş is in Ankara; and the company runs administrative branches in Istanbul-European side, Istanbul-Asian side.



## **APPENDIX B AUTOMOBILE LOGISTICS**

The vehicles found in the central warehouses of the leading car manufacturing firms in Turkey, are transported by Reysaş to the dealers' workplaces in coordination with the firm, within the framework of the cargo programs. Through the passwords given to the dealers with the satellite monitoring system used by Reysas for all its vehicles, instant data can be received on the exact location of the vehicles.

Since Reysas aims to achieve zero damages in all its transportation activities, the trucks of whose loading operations are completed, pass through the checkpoint before exiting from the gate, and depart from the area after receiving the final confirmation.

Our drivers receive periodical training programs for all types of vehicles at the Reysaş Academy Training Center. Based on the understanding that “No matter how impeccable cars you manufacture, it will not be important unless you deliver these cars to the customers in an equally impeccable manner”, the dealer distribution of the cars manufactured by the major car manufacturing firms in Turkey, and all operations concerning loading and unloading of the cars on the boats, are performed by our professional team with great care and attention.

## **APPENDIX C CAR WAREHOUSING**

We own vehicle warehousing area covering a space of 95,000 m<sup>2</sup>, which is under constant supervision by the most advanced security systems for 24 hours a day. Electronic addressing and barcoding systems are used in our areas and prior to their dispatch; data concerning the location of the vehicles can be monitored in detail through their chassis numbers.

The inspection procedure applied on the vehicles prior to the delivery of the vehicles of whose final import procedures are finalized, and of whose production processes are completed, for the determination and elimination of all defects, is called “Pre-Delivery Inspection” (PDI).

During this process, the vehicles are inspected with great scrutiny by teams who are fully trained and specialized in PDI work. The parts that have arrived in dismantled form are reassembled. Checks are applied to determine the damaged or missing parts, followed by the washing and cleaning services. The logistics services must be performed without any delays or failures throughout 24 hours each day.

## APPENDIX D FOREIGN TRADE TURKEY AND EU

**Table 3.4: Breakdown by Country of the Foreign Capital Organisations of EU-15 Origin Operating in Turkey**

	Number of Firms
Germany	1482
Austria	34
Belgium	143
Denmark	75
Finland	25
France	398
Netherlands	705
Britain	604
Ireland	48
Spain	92
Sweden	61
Italy	346
Luxemburg	76
Portugal	8
EU Total	4124
Grand Total	8884

Source: Undersecretariat of Treasury

Table 3.1

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Import	22,870	29,428	23,270	35,709	43,627	48,559	45,935	40,671	54,503	41,399	51,553	69,340
Total Export	14,714	15,375	18,106	21,637	23,225	26,261	26,974	26,588	27,775	31,334	36,059	47,252
Total Trade	37,584	44,803	41,376	57,346	66,852	74,820	72,909	67,259	82,278	72,733	87,612	116,592
Total Trade Deficit	8,156	14,053	5,164	14,072	20,402	22,298	18,961	14,083	26,728	10,065	15,494	22,088

of dollars )

Share of Import from the EU in Total Import	44	47	47	47	53	51	52	53	49	44	45	46
Share of Exports to the EU in Total Export	52	49	48	51	50	47	50	54	52	51	51	52

Source : SPO, SIS

**Table 3.2 Turkey-EU Foreign Trade**

(in billions of dollars)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004*
Exports	6.9	7.0	7.6	7.6	8.6	11.0	11.5	12.2	13.5	14.3	14.3	16.1	18.5	24.5	20.2
Imports	9.3	9.2	10.0	13.9	10.9	16.9	23.1	24.9	24.1	21.4	26.6	18.3	23.3	31.7	27.6
Total trade	16.2	16.2	17.6	21.5	19.5	27.9	34.6	37.1	37.6	35.7	40.9	34.4	41.8	56.2	47.8

Source: SPO

\* January-August

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