

Dissertation Report

On

Study of the Supply Chain Risk Management in Courier Industry

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Declaration

I Rashmi Bharadwaj, 2K11/MBA/39, student of Delhi School of Management hereby declare that I have pursued a research study on the topic **“Study of the Supply Chain Risk Management in Courier Industry”** under the guidance of Dr. Richa Mishra, Associate Professor, Delhi School Of Management. I also declare that this work has not been submitted in part or full to this or any other organization/ institute as part of any project work by me.

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It is indeed a matter of great pleasure to present this project report on the topic **“Study of the Supply Chain Risk Management in Courier Industry”** to The Head, Delhi School Of Management. I gratefully acknowledge my profound indebtedness towards my esteemed guide Dr. Richa Mishra, Associate Professor, Delhi School Of Management for her invaluable guidance, excellent supervision and constant encouragement during the entire the project work. I also take the opportunity to thank Prof. P.K.Suri, Head, Delhi School Of Management for being a constant support in deciding the framework of the research study

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Certificate

This to certify that the dissertation report entitled **“Study of the Supply Chain Risk Management in Courier Industry”** is submitted by Rashmi Bharadwaj (2K11/MBA/39) in partial fulfillment of the requirement for the award of **Master of Business Administration by Delhi School Of Management, Delhi Technological University, New Delhi** is a record of the candidate’s own work carried out by her under my supervision. The matter embodied in the report is original and has not been submitted for the award of any degree.

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Executive Summary

In a move to cut down costs, producers are exploring around the globe in search for the lowest cost exporters/suppliers. Lured towards developing countries in south-east Asian region for lower-wages, transportation industry is stretching its reach longer than ever before. Major players are focusing overseas markets for outsourcing cheap manufacturing as well as expanding their businesses. This results in outbound logistics. Couriers are basically a service for sending money or goods at some extra cost. It involves a person or a company engaged in transporting, dispatching and distributing letters, parcels and mails. In a rather layman term, it can be said that, compared to normal mail service, a courier possess many added features.

More and more courier companies appear on a regular basis, and different courier logos and branding on vans and planes can be seen across the world. Many of these courier companies operate independently, whereas others rely on some of the larger courier companies when it comes to providing international deliveries. One of the main reasons for the increase in courier companies is the boom in global trade, probably largely down to the Internet. Couriers have to deal with all sorts of requests from delivering simple mail documents to large electronic items like computers, printers and televisions. Simply put, the courier market has grown due to demand from customers and businesses. The study therefore focuses on the various aspect of the supply chain management in courier industry which makes it efficient to any market variation.

Supply chain risk management is gaining immense popularity due to globalization of competitive landscapes, and growing threats and uncertainty. Risk management in supply chains is directly linked with supply chain agility and hence it needs to be done in very organized and objective manner, incorporating quantitative models. Despite increasing awareness among practitioners, the concepts of supply chain vulnerability and its managerial counterpart supply chain risk management are still in their infancy.

The existing literature on supply chain vulnerability and risk management is reviewed and compared with findings from case studies of courier industry to discover practitioners' perceptions of supply chain risk. Special focus is on the corporate financing issues of current supply chain risk management strategies used in courier firms. The risk management practices are analysed by studying the literatures on Enterprise Risk Management (ERM), and then focus on how supply chain risk management domain can be mapped with it. The study finally concerns with Supply Chain Risk Management of 50 different courier companies. The report concludes with a summary of overall findings.

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CHAPTER-1

INTRODUCTION

1.1 Industry Overview

Salient Features of the Industry

- The courier industry specializes in time-definite, reliable transportation services for documents, packages and freight.
- The Global Courier and Delivery Services industry has experienced relatively stagnant growth in the past five years.
- During this time, the industry's revenue is estimated to grow at an annualized rate of just 0.1% to reach \$188.5 billion, largely weighed down by the global recession.
- Sales are now expected to rise, even to 1.4% in 2013. The primary driving forces is the increase of technology and e-commerce. Online sales via mobile commerce reached over \$24 billion in 2012.
- With the increase of e-commerce sales of 16% yearly, many companies understand there is truly a link to be connected between online retail and their brick-and-mortar store sales.
- Revenue collapsed in 2009 and remained weak in 2010, as the global economic downturn diminished demand for courier services.
- International express cargo holds 6% of the express cargo industry, but is forecasted to reach 40% by 2017

Courier industry — It's all about technology:-

The past years have been one of increased activity in the air express market with FedEx, UPS and DHL focusing on India with services and products. Though the express and logistics industry has seen double-digit growth, automation, service standards and systems are still far below international standards. The Indian shipper, therefore, has to deal with extremes — the best of technology or none at all.

Global trade boom and sudden upsurge of e-commerce market is significantly boosting the courier market in India. The service is distinctive by its premium services like speed, security, tracking, signature, committed delivery time and specialized & individualized service in comparison normal postal services. Some of the key drivers of the industry include global trade boom, growth in e-commerce, financial institutions dependence on courier, growing business of private telecom sector and seasonal business upsurge due to occasions. The e-commerce delivery market is growing at over 50 per cent, giving rise to start-up companies.

E-commerce logistics needs more tech platforms which can track shipments right from the time a buyer clicks to pay, to the delivery

The advancement of technology has had a major impact on the courier industry. Even to the point where the impact has caused the courier industry to never be the same. More items that couriers would normally pick up for clients are changing. The once high in demand documents that needed to be picked up ASAP, businesses are submitting these same documents via e-mail or online.

Be it changing business scenario or technology change, it is confirmed that the courier industry will experience growth. One reason for the growth is due to the economy and businesses' pursuit to cut their costs. They are changing, converting more into online business and less physical operation locations. This means all they primarily need is to transport their product or car parts from one source to another, or directly to their end customer. Even home businesses are using this practice. A courier is becoming in high demand to assist in these types of efforts. As a result, the courier industry, although business decreases in one sect, grows in another.

Growth of Courier Industry in India:-

- The Indian express industry is set for sizzling growth, despite rising usage of facilities like short messaging services or multimedia message services.
- If anything, several large-sized corporate and multinational express players are keen on acquiring controlling stake in some of established Indian courier companies.
- The reason: India's express industry is expected to register a growth of at least 20 per cent per annum during the next five years and more than double its size by 2012, according to a study by rating agency Credit Analysis & Research.
- Opening of banking, insurance, retail, aviation and telecom sectors and their penetration to smaller cities would be the major growth driver.
- According to CARE, the size of India's courier industry currently stands at around Rs 7,100 crore (Rs 71 billion) and is estimated to have grown at a CAGR of around 33 per cent over the past decade. At its current estimated size, the courier industry is larger than the tea industry and close to the size of paper and shipping industries in India.

- The industry ranks amongst the fastest growing segments of the Indian economy and over the next five years, it is expected to register a growth rate higher than of industries such as retail, banking, financial, chemical and automobiles.
- The industry is highly fragmented with more than 2500 express players and a few large sized players account more than half of the industry revenues.
- The industry contributes more than Rs 1000 crore (Rs 10 billion) to the government revenues by way of service tax, income tax and other levies and it offers employment opportunity to about a million people.
- According to an Edelweiss Research study, the organized part of the express industry in India is 65 per cent of the total market. "Organized sector in the domestic market is little less than 50 per cent. The unorganized and semi organized segments, which consist largely of regional and intra-city service providers and EMS Speed post, account for the rest," it says.
- "The organized segment, including the international majors' share, constitutes approximately 65 per cent of the total and is made up of a small group of fewer than two-dozen players," Edelweiss adds.
- Amongst domestic players Blue Dart, DTDC, First Flight and Overnite Express are leading express services companies in India while UPS, FedEx, DHL and TNT are leading international player's presence in the country.
- According to the CARE survey, the industry players earn about 52 per cent of its revenues from document parcels.
- Document parcels weighing less than 300 grams account for about 70 per cent of the volume of document parcels and intra-city deliveries account for nearly 37 per cent of their turnover.
- Challenges faced by the industry include matching up to the rising expectations of the customer, expanding the network to reach hitherto uncovered areas, containing rising fuel and freight costs and retention of manpower.

Logistics – The backbone of Courier Industry:-

- Logistics is concerned with getting the products and services where they are needed when they are desired. It is difficult to accomplish any marketing or manufacturing without logistical support. It involves the integration of information, transportation, inventory, warehousing, material handling, and packaging.
- The operating responsibility of logistics is the geographical repositioning of raw materials, work in process, and finished inventories where required at the lowest cost possible
- The formal definition of the word ‘logistics’ is: - it is the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements.
- In order to understand the concepts of logistics in terms of practical usage and to glimpse into the how a real company or organization uses logistics as a formidable tool to gain customer satisfaction, reduce overall cost and increase efficiency we selected —DHL the world’s leading courier Service Company. But DHL is multi-faceted and offers myriad types of services.

Global Logistics Scenario

In a move to cut down costs, producers are exploring around the globe in search for the lowest cost exporters/suppliers. Lured towards developing countries in south-east Asian region for lower-wages, transportation industry is stretching its reach longer than ever before. Major players are focusing overseas markets for outsourcing cheap manufacturing as well as expanding their businesses. This results in outbound logistics. And acceleration in manufacturing capacity is driving many producers to shutter superfluous plants. The rest of the plants are gaining the developing rhythm, but must export overseas now to sustain their positions in the market.

Boom in the Internet based services made overseas suppliers capable to match foot with local suppliers. Web-based sales, services and supplies are emerging vertically. The expanding reach has compelled logistic industry to spur cross-border trade. Regardless-of this outbreak of activity, it is commonplace also for expert managers of local logistics to get acquainted with the complexity of international trade logistics. Global transportation and relevant services includes much complex documentation than for domestic shipments. It almost

includes longer delivery times. Evaluation of the arrival times of international shipments is just a magic than solid fact.

The business players always look for just-in-time shipments, thus it aspires enhanced build to order model and lot-size-of-one shipments, which results more pressure on logistics industry. Logistics industry has usually been old-fashioned traditions. Usually, the shipping personals would decide for carriers, customs agents and so on. Normally, their search doesn't go beyond the initial service providers who cover all the minimum requirements. Once the shipment kicks off its journey towards its destination, it is really hard to assume reaching time.

For example, a ship that started its journey from Asia could meet harsh weather, which may delay its reaching on the West Coast for three days. On the other hand, the trucks at the West Coast would have to wait and sat empty and ideal for the three days, which would certainly result in big loss. These kind of unpredictable losses are usual in international logistics. Thus, even the largest multi-national companies avoided logistic services on a worldwide basis. They opt to establish their operations in each country and let them to manage logistics individually. The boom in Internet services changed international logistics rapidly.

At present, vendors can cater massive numbers of global shipments. Complying with this, they create and uphold substantial databases, which cover country-specific laws and regulations. Factually, thousands of combinations of containers, ports, and so on are likely counted for moving a shipment. International logistics vendors also maintains cost and route information on hundreds of hundreds carriers, which are operational in dozens of regions, which offers both lower freight bills and cutting of delivery times.

A biggest disadvantage in international logistics is the vagueness in arrival times. Materials managers have had modest choice, so they had get around by adding more safety stocks. Thus, the costs of inventory management in the overseas parts are naturally higher. The uncertainty of delivery time is due to not tapping of international shipments closely and step by-step. This is easier said than done. However vendors are now offering tracking system, which is necessary in continuous tracking of both international logistics network, and electronic visibility in each yard and carrier. Although there is much to be done to achieve this stage, the pieces of the puzzle are gradually coming together. Even though vendors are offering a worldwide network, significantly added and dedicated, equipment is still required.

For example, tracking completed products needs a yard management system, which recognizes each container in the yard and its placement.

The radio frequency Identification (RFID) tags in containers, whose place is detected by antennas located in the yard. Maintaining the clear vision also needs tracking the containers as soon as they leave the yard. This tracking is possible by Global Positioning (GPS) systems and satellites, however, use of these systems are not usual at present. As a result, the industry does not provide step-by-step tracking of container.

An important trend among logistics services providers would aid the industry. Logistics industry veterans unveil that logistics service providers are extending reach worldwide and expanding their services too. Regardless of understandable limitation, global logistics should obviously improve. Web-based companies and technically ground-breaking carriers such as UPS Logistics, Ryder, and others will carry on showing the way. Global logistics in near future should be distant more faultless and reasonably priced than ever.

Size of the global logistics industry

Currently the annual logistics cost of the world is about USD 3.5 trillion. For any country, the annual logistics cost varies between 9% and 20% of the GDP, the figure for the US being about 9%. US-based Armstrong & Associates, Inc. tracks the issues and trends in the world logistics market and in the US logistics market, in particular, in their annual surveys of top 25 global LSPs. According to the firm, the global logistics market sizes in 1992, 1996 and 2000 were USD 10 billion, USD 25 billion and USD 56 billion, respectively. In 2003 and 2004, the corresponding figures were USD270 billion and USD 333 billion, registering high growth rates. Though most of the large LSPs are headquartered in Europe, the US logistics market is the largest in the world capturing one-third of the world logistics market. In 2003, it was about USD 80 billion.

In 2004, it grew to USD 89 billion, and in 2005, it registered an impressive growth rate of 16% to cross the USD 100 billion mark for the first time and reach USD 103.7 billion (Foster and Armstrong, 2004, 2005, 2006). However, considering the fact that the logistics market in the US is about 10% of its annual logistics cost (Foster and Armstrong, 2006), there is still immense potential for growth of 3PL in the US in particular, and in the world in general.

1.2 Courier Companies' Study

Courier Services in India:-

Indian courier industry had its start some 15-20 years ago. The courier industry was initially limited to the four metros – New Delhi, Mumbai, Kolkata, and Chennai and to some extent to Bangalore. The reason was the airport connection these metros were. But, the changing economy and technical advancement seen on a daily basis, the industry has grown and extended faster to several cities and even rural areas. And it is still growing.

A courier company anywhere in the world has its primary virtue is its efficiency to render services. The better the quality of service, the more the satisfied customers, better the chances of survival. The industry is booming and market is cut-throat competitive. The advancement of technology and internet has things slight easier and more competitive as well.

Courier services in India can be segregated in few categories. Basically, it begins with intra-city services which are about speedy delivery of mails and goods within the city. Broadening the services, inter-city services are covered. Normally this is termed as surface cargo services where short distance and bulk loads are handled. Surface mode service is performed through two ways: firstly, on road (by bus or vehicle) and secondly on track (by train) services. The products are normally delivered through door to door.

Courier companies work in tandem with the foremost airlines and in sync with their well-tuned, well associated set of connections the timely deliverance and protected service is guaranteed. Few other variant of services could be express services, ocean freight, industry solutions, logistic solutions, shipping tools. These particular services are individual of a company's area of specialization and diversification. If one tries to find a courier company in India, one can find them in every nook and corner of the large part of India. The numbers of courier companies in India have seen a growth reminiscent of wildfire.

Many factors have contributed towards this huge spread. Economic growth, technological advancements, escalation of industrial sector, increase in export and import and large scale effect of liberalization are few of the major reasons. Now a day, courier companies are considered as vital component of any economy.

In the earlier days, the major courier players were centered in major metros because of their better connectivity with airport, ports and railways. But with India rapidly becoming a major

economic force, now more and more companies are covering cities, towns and rural areas under their wide network. Despite that development, the large and medium sized companies are still based in the metro cities of India.

The courier industry has world over been recognized as an essential and indispensable part of any economy. In India, various factors like growth of the industrial segment, growth in exports and imports and overall economic scenario of the country have contributed to the growth of the courier industry. Domestic courier industry with a turnover in excess of INR 22 bn is still in a nascent stage. India has more than 2,300 courier companies. It is a highly disintegrated industry with nearly 20 players in the organized sector, 2,000 in the semi organized sector, and the rest in the unorganized sector. There are a few major players in the organized sector who have a combined market share of 90%.

Indian courier industry was initially limited to all the four metros. The reason was the airport connection these metros were having. The industry had its start some 15-20 years ago. But with changing economy and technical advancement seen on a daily basis, the industry has extended fast to several metropolis, township and even rural areas. Train, bus, motorcycle and even bicycle have helped the industry in this regard. Industry has travelled a long way and now it has become a very common sight to see an office of Courier Company in the nearby locality. Owing to the growing demand for reduced transit time and early deliveries the industry is forecast to grow at 25% for the next two to three years, making this one of the fastest growing segments in the transportation of cargo. International express cargo holds 6% of the express cargo industry, but is forecasted to reach 40% by 2017.

These are some key players in Indian Courier Industries:

1. Blue Dart
2. DHL India
3. FedEx India
4. First Flight Couriers
5. AFL
6. Gati
7. Elbee Express
8. Overnite Express
9. TNT India
10. UPS India

Blue Dart Express Ltd. (Blue Dart) is the market leader, with a 36% market share in the domestic market, and Elbee Services Ltd., the second largest player, has a 20% market share. AFL-DHL is primarily focused on the international segment, where it is the market leader, whereas Gati Corporation Ltd. (Gati) is the market leader in the domestic packages, ground distribution segment. In the domestic air packages segment, Blue Dart, having developed its own air network and aircraft operations, is currently the market leader.

1.3 Objectives of the study

- To study the concept of Supply Chain Risk management with emphasis on financial aspects
- To study the Best practices of Supply Chain Risk Management.
- To study the inbound and outbound supply chain management of courier companies situated in Delhi-NCR
- To analyse the approaches of Supply Chain Risk Management used by the companies.
- To understand the companies' view of Supply Chain Risk Management function and practices.

CHAPTER-2
LITERATURE REVIEW

2.1 Supply Chain Risk Management: Conceptualization

Supply chain risk management (SCRM) is "the implementation of strategies to manage both everyday and exceptional risks along the supply chain based on continuous risk assessment with the objective of reducing vulnerability and ensuring continuity"

Supply chain risk management (SCRM) is a business practice in which professionals look at the supply chain and assess it for risk. Risk in the supply chain can be broad and can deal with internal or external risks. Unlike other risk management activities, supply chain risk management must be coordinated between managers and all aspects of the supply chain. SCRM is used to assess problems that need to be fixed or, in the worst-case scenarios, assess when a product becomes too risky to produce.

On the external side, supply chain risk management looks at problems that occur outside the company. This includes demand for the product, disturbances in other companies producing the product, the financial stability of related businesses, and the condition of the supplier's facility. To mitigate these problems, the risk managers will often speak with managers of the other facilities and companies and will create strategies such as using backup companies to produce a product.

Internal supply chain risk management deals with the main company's risk. Some of the risk factors are similar to external supply chain risk management, such as the manufacturing of the product if done by an internal branch of the company. Other factors include change of management or key personnel within the company or problems with planning or lack of planning.

In defining the concept of supply chain risk management, we suggest that it is relevant to distinguish four basic constructs: supply chain risk sources, risk consequences, risk drivers and risk mitigating strategies. 'Risk sources' are the environmental, organisational or supply chain-related variables which cannot be predicted with certainty and which impact on the supply chain outcome variables. Risk consequences are the focused supply chain outcome variables like e.g. costs or quality, ie the different forms in which the variance becomes manifest.

2.2 Risk Identification and Assessment (Financial View)

All business activities somehow find their way into the balance sheet and profit and loss statement of a company. The current assets (be it material or immaterial) and future profit expectations, lead to a company specific financing volume and a corresponding financing rate/cost. Of course, supply chain management is no exception. This research along with its main objectives of studying Supply Chain Risk Management also tries to explain the links between supply chain management and finance and highlights some implications of Corporate Financing in Supply Chain Risk Management. Various events have vividly demonstrated that a disruption affecting an entity anywhere in the supply chain can have a direct effect on a corporation's ability to continue operations, get finished goods to market or provide critical services to customers and thus finally affect the account books of the firm. When it comes to courier industry correct Supply Chain Management and efficient Supply Chain Risk Management is really essential. Organisations that think they have managed risk have often overlooked the critical exposures along their supply chains foregone the financial synergies.

Risk managers must assess financial impacts that manifest from problems in the supply chain from the beginning. Managers must also come up with strategies to fix or alleviate these problems. This information is often looked over. Supply chain risk management, for every potential problem, typically includes a list of possible vulnerabilities the company will suffer. This allows managers to plan for scenarios that could halt operation. By knowing every risk and vulnerability, plans can be made in advance to alleviate otherwise devastating problems, allowing the company to continue making money. Along with assessing for vulnerabilities and making strategies, supply chain management must also figure the cost for such strategies.

While risk management is extensively studied in the context of single firms, risk management in supply chains is a growing stream of research for two main reasons. First, interdependencies of firms through their traditional supply and demand transactions make the focal firm vulnerable when another firm on its upstream or downstream side encounters adverse events. This interdependence motivates studies of supply chain risks. While the main objective of supply chain risk management is well articulated in terms of protecting the supply chain from any risk that can adversely affect its performance and continuity, the problem often lies in the difficulty in identifying the risks in the first place.

The first step in the risk management process is the identification of the risks posing threats to the supply chain. Once risks are identified, supply chain practitioners face the subsequent challenge of assessing these risks in order to develop the appropriate risk management strategy. Risk classification is regarded as a prerequisite in identifying risks. Risk classification is also essential for assessing the risks. Although risk classification facilitates a systematic identification of potential risks, identification of risk is argued to be a function of two factors: managers' perceptions and characteristics of the industry. Once various risks are identified, managers then proceed to assess risk to evaluate its potential impact on the firm's performance. A number of researchers have a common understanding that risk assessment entails the evaluation of two variables:

- (i) Likelihood of occurrence of an adverse event and
- (ii) Magnitude of their impact on the supply chain's performance should the event occur

In a supply chain context, risk assessment also involves locating parts of the chain that are most susceptible to risk and portraying the form of damage that may be endured in case the adverse event occurs. At this stage, managers face the challenging task of quantifying the likelihood of occurrence of the adverse event and the magnitude of its impact on supply chain performance. While the likelihood of occurrence can be measured using historical data, the impact level can be measured in financial terms (e.g. loss in returns, value at risk), operational terms (e.g. production delay period, number of customers not served) or in strategic terms (e.g. loss of goodwill, loss of market shares). The severity of impact may also be in itself a factor in determining the proper mitigation tool to use.

2.3 Risk management practices

Supply Chain Risk Management (SCRM) entails managing risks that can hinder the performance of supply chains. Manuj and Mentzer (2008a) define global SCRM as “the identification and evaluation of risks and consequent losses in the global supply chain, and implementation of appropriate strategies through a coordinated approach among supply chain members”.

In the popular, practitioner-oriented risk management literature (eg. Goldberg et al., 1999), the uses of the term ‘risk’ can be confusing because it is perceived as a multidimensional construct (Zsidisin forthcoming). On the one hand, it is used to refer to uncertain internal or external, environmental variables that reduce outcome predictability. In this sense, ‘risk’ actually refers to a source of risk and uncertainty, such as ‘political risks’ and ‘market risks’ or, from a supply chain view, ‘the volatility of customer demand’. On the other hand, the term risk is also used when referring to the consequences of risks, ie to the potential outcome indicators. In this sense, the terms ‘operational risks’, ‘human risks’ or ‘risks to customer service levels’ are consequences of risks becoming events.

In defining the concept of supply chain risk management, it is suggested to adopt the definition provided by March and Shapira (1987) and define ‘risk’ as “the variation in the distribution of possible supply chain outcomes, their likelihood, and their subjective values” (p. 1404). From supply chain perspective, these uncertain variations or disruptions affect the flows of information, materials or products across organisation borders (LaLonde, 1997). Supply chain risks hence comprise “any risks for the information, material and product flows from original supplier to the delivery of the final product for the end user.” In simple terms, supply chain risks refer to the possibility and effect of a mismatch between supply and demand.

Among practitioners, risk taking is generally perceived as an integrated and inevitable part of management (March and Shapira, 1987). In their view, risk taking equals decision making under uncertainty and hence any strategic choice has certain risk implications. For supply chain contexts, Braithwaite and Hall (1999) emphasise that the relationship between corporate strategy, risk and the implications for supply chain management are poorly understood and in need of further exploration. In defining the concept of supply chain risk

management, a distinction is made between supply chain risk drivers and risk mitigating strategies.

Several writers propose that some of the influences on contemporary supply chain management in the last decade, such as for example the globalisation of supply chains or the trend towards outsourcing, have exacerbated the risk exposure as well as the impact of any supply chain disruption (Christopher and Lee, 2001; McGillivray, 2000; Engardio, 2001). Since competitive pressures are often the drivers of risk, Svensson (2002) uses the term “calculated risks” (p. 119) that a company takes in order to improve competitiveness, reduce costs, and increase or maintain profitability. Risk mitigating strategies on the other hand are those strategic moves organisations deliberately undertake to mitigate the uncertainties identified from the various risk sources (Miller, 1992). The four, interrelated basic constructs of supply chain risk management are summarised in the following figure. From this structure, the terms supply chain vulnerability and supply chain risk management can be derived: Supply chain vulnerability is “the propensity of risk sources and risk drivers to outweigh risk mitigating strategies, thus causing adverse supply chain consequences”. Whereas from a single firm perspective, the adverse consequences affect a firm’s goal accomplishment (Svensson, 2002, p. 112), in a supply chain context, they jeopardise the supply chain’s ability to effectively serve the end customer market. Supply chain risk management aims to identify the potential sources of risk and implement appropriate actions to avoid or contain supply chain vulnerability. Consequently, it can be defined as “the identification and management of risks for the supply chain, through a co-ordinated approach amongst supply chain members, to reduce supply chain vulnerability as a whole.”

Kleindorfer and Saad (2005) and Svensson (2001) emphasize the necessity of identifying risks as well as their sources to enhance risk management. However, the literature suffers from a shortage of risk identification methods (Rao and Goldsby, 2009). Acknowledging this shortage, Neiger et al (2009) propose a methodology based on value-focused process engineering (VFPE). The perception of risk as a process objective allows the authors to use the VFPE (a methodology usually used to identify objectives) in identifying supply chain risks. Miller (1992) argues that his classification of the uncertainties encountered by international firms would clarify the “relevant dimensions” of these uncertainties. The author presents three major categories of uncertainties: general environment, industry and firm. Under each category, a number of major classes of uncertainties are identified. Specific

factors are then listed under each class, encompassing the different dimensions of uncertainties.

Triantis (2000). classifies risks into five major categories. These are the technological, economic, financial, performance and legal/regulatory risks. The financial category comprises four sub-categories, of which one is the foreign currency exchange rate risk. The author then discusses three distinct risks stemming from exchange rate risk: transaction, translation and competitive risks. The identification of these three risks illustrates the direct benefits of effective risk classification as the distinctions among the identified risks are useful in assigning the proper risk management approach. In their 1994 survey, Bodnar et al(1995) find that 80% of the firms which use derivatives hedge their commitments (transaction risks), 44% of the firms hedge the balance sheet (translation risks), and 40% hedge economic exposure (competitive risks).

Sheffi and Rice (2005) identify three classes of possible disruptions to the firm: random events, accidents and intentional disruptions. They contend that the method of estimating the likelihood of each class differs. Consequently, risk classification is thus indispensable for setting the appropriate risk management strategies. Chopra and Sodhi (2004) call for managers to “understand the universe of risk categories as well as the events and conditions that drive them” to be able to develop effective supply chain risk management tools. In this context, one can refer to various categories defined by a number of researchers in their attempts to classify risks and sources of risks (e.g. Ghoshal, 1987; Miller, 1992; Ritchie and Marshall, 1993; Triantis, 2000; Svensson, 2001; Juttner et al, 2003; Christopher and Peck, 2004; Chopra and Sodhi, 2004; Tang, 2006a; Ritchie and Brindley, 2007; Manuj and Mentzer, 2008a; Blos et al, 2009). Furthermore, the characteristics and practices of supply chains alter the nature of exposure of chain members to traditional risks, facilitating the emergence of new approaches to manage these risks.

In the context of SCRM, we focus on two main characteristics of supply chains: structure and operational practices. The structure of a supply chain is typified by the global presence of the members of the chain and by the integrated business processes among these members. Some of the operational practices that are pertinent to risk management are the lean production system, single sourcing and information sharing across the supply chain. These practices can easily be contrasted to their conventional counterparts of mass production, multiple sourcing and unit-based information flow. The competitive advantages of a supply chain are made

possible by the effective exploitation of its network design and the efficiency of its operational processes. Coupled with these benefits, however, are the threats to the supply chain that make it more vulnerable as its risk exposure is altered by its structure and practices.

Globalization, although a major attribute of a supply chain structure, is not an exclusive characteristic of supply chains. While many companies have overseas suppliers and market their products in foreign countries, other supply chains operate purely on a domestic level. However, operating globally exposes supply chains to a number of pertinent risks (Manuj and Mentzer, 2008a). In fact, the empirical results of Thun and Hoenig (2011) show that globalization is the most prominent supply chain risk driver perceived by the respondents of their study. Risks in supply chains stem from various sources including socio-political and economic developments, natural and man-made disasters and fast changes in market requirements (Tang, 2006a; Khan and Burnes, 2007). The worldwide location of production facilities and the flow of products across countries expose firms to uncertainties in exchange rates and input prices (Ding et al, 2007). Globalization is also found to be a statistically significant driver for catastrophic risks. In their large-scale empirical study, Wagner and Bode (2006) found that global sourcing makes supply chains vulnerable to catastrophic risks such as terrorist acts, socio-political crises, natural disasters and epidemics.

The complexity of a supply chain structure plays a significant role in its vulnerability (Harland et al, 2003; Tang, 2006b; Neiger et al, 2009). Lambert et al (1998) identify three aspects of the complex structure: members, structural dimensions and types of process links. The ‘focal’ firm, from whose perspective the network is designed, integrates its ‘value-adding’ processes with the ‘primary’ members and receives support from ‘supporting’ members. The number of tiers across the chain and the number of firms within each tier determine the ‘horizontal’ and the ‘vertical’ structure respectively. While these two structural dimensions reveal the breadth and depth of the whole structure, the ‘horizontal position’ is a dimension that locates a specific company along the width of the structure. Finally, the authors identify four types of business process links based on the extent of involvement of the focal firm. These links can be managed, monitored, non-managed or non-member process links. This classification facilitates the allocation of the appropriate resources to manage these business processes in an efficient manner. The links between firms in the supply chain structure are not independent business-to-business relationships, but collectively make the supply chain a “network of multiple businesses and relationships” (Lambert and Cooper,

2000). As competition between discrete firms is changing to competition between supply-chains (Christopher, 1992), a robust supply chain structure provides members of the chain a competitive edge. However, the complexity of the supply chain structure also gives rise to new sources of risks that are “network-related”, namely uncertainties due to three factors: chaos, lack of ownership and inertia (Juttner et al, 2003). An example of ‘chaos’ is the well-known ‘bullwhip effect’ (Lee et al, 1997) that depicts increasing fluctuations of order quantities from the downstream to the upstream of the supply chain. In general, the lack of confidence among members of the supply chain leads to such chaos and increases the vulnerability of the supply chain (Christopher and Lee, 2004). The lack of ownership stems from the complex relationships that a firm may develop with its upstream and downstream partners. These relationships can be so complicated that the responsibilities of the various members in delivering the end product become uncertain. Inertia risks are associated with lack of responsiveness to changes in the business environment and market conditions.

The vulnerability of supply chains due to globalization and network complexity, as discussed above, can be classified as ‘structural’ as it is directly related to the physical and tangible configuration of the supply chain. Accordingly, one can categorize the vulnerabilities caused by the procedural and intangible configuration of the supply chain as ‘infrastructural’. The vulnerability to catastrophic events illustrates the distinction between these two categories. Knemeyer et al (2009) notes that not only the physical global spread of supply chains expose them to more natural or man-made catastrophes, but also the lower ‘slack’ in inventory diminishes the opportunities to deal with these events. Hence, one can intuitively conclude that the structural vulnerability of supply chains involves increases in the likelihood of adverse events, while the infrastructural vulnerability involves the ability to mitigate the consequences of these events. Blackhurst et al (2005) and Svensson (2002) relate the vulnerability of supply chains to an increase in the use of supply chain practices, such as increasing responsiveness to customers, achieving higher agility and operating lean systems. Many authors relate the adoption of lean management practices to the increase in the supply chain vulnerability (e.g. Norrman and Janson, 2004; Thun and Hoenig, 2011). Such practices encompass, among others, just-in-time (JIT) arrival of material at any production workstation when needed. The implementation of JIT creates time and functional dependencies within the supply chain, rendering it vulnerable to potential disruptions (Svensson, 2002), due to the fact that any adverse event occurring at any node of the chain will affect the other nodes (Norrman and Janson, 2004). Single sourcing is another practice widely used in supply

chains. Despite various benefits of single sourcing such as ease of management, quantity discounts from order consolidation, reduced order lead times and logistical cost reductions (Burke et al, 2007), purchasers are obviously affected by any problem encountered by their sole supplier (Kelle and Miller, 2001).

In previous sections, we argued that various characteristics of supply chains make them more vulnerable to risks. However, one can contend that the characteristics of supply chains also enable firms to better implement some risk management strategies and even create new opportunities to manage risks. There is a direct relationship between the geographical dispersion of supply chains and their risk exposure. It is evident that the global activities of a supply chain expose the participating firms to various risks that emanate from this global environment. However, this global presence can provide a firm the ability to overcome risks originating from exchange rate fluctuations. Hommel (2003) argues that a firm's global presence creates two risk management opportunities: operational flexibility and geographic diversification. The former provides the real option of switching production between facilities in two countries to offset any adverse change in the exchange rate between the two currencies. The latter can perfectly substitute for a symmetric financial hedge, normally used by exporters, by locating a production facility in the foreign country to manage exchange rate risk. One other aspect of supply chain structure is the tight integration among its members. Braunscheidel and Suresh (2009) report that the external integration of a firm with key suppliers and customers is the strongest driver of the 'firm's supply chain agility'. 'Structural' risk management capabilities of supply chains are complemented with 'infrastructural' capabilities acquired by the supply chain practices. Information sharing is one such capability that integrates the supply chain. Information sharing can significantly reduce the possibility of a 'bullwhip' effect by efficiently exchanging the actual demand data from the point-of-sales to the multiple upstream suppliers. Eliminating distorted information makes the supply chain better prepared to respond to changing market needs (Masson et al, 2007). Information sharing also reduces uncertainties through more accurate demand forecasting (Guo et al, 2006), inventory levels, sales promotion strategies and marketing strategies (Mentzer et al, 2001).

The method deployed to manage risk may depend on the firm's specific circumstances. Considering an information gathering process as a means to reduce risk by buyers, Mitchell (1995) relates the nature of such a process to the level of expertise of the buyer, the level of risk and the company's size. The selection of a risk management approach depends also on

implementation costs. Firms should ensure that the cost does not exceed the benefits of eliminating or reducing the risk (Miller, 1992; Chopra and Meindl, 2003; Servaes et al, 2009). The literature is short on providing guidelines for selecting suitable supply chain risk management approaches (Manuj and Mentzer, 2008a). This deficiency makes it difficult to come up with a general process to set a comprehensive risk management strategy. Froot et al (1994) observed that “there is no single, well-accepted set of principles” that guide the hedging programs of the various firms. Many researchers, nonetheless, provide a classification of the various risk management approaches which compensates for the absence of systematic guidelines to select a risk management approach that best fits a specific supply chain environment (e.g. Miller, 1992; Svensson, 2001; Juttner et al, 2003; Chopra and Sodhi, 2004; Sheffi and Rice, 2005; Tang, 2006a; Thun and Hoenig, 2011).

CHAPTER-3
RESEARCH
METHODOLOGY

Research Methodology Used

A well structured research process is vital in order to get the best out of the field work. Sampling and questionnaire preparation are two significant aspects of a successful project work. The use of quantitative research methodology is more helpful while doing the EXPLORATORY RESEARCH of this type. In order to tap the “mental” maps and experiences of supply chain professionals, a discovery oriented, practitioner-based approach was applied, with semi-structured surveys being the primary method of data collection

- ❖ **DATA COLLECTION:** The biggest task of collecting the data for the project was accomplished by getting the questionnaire filled from the managers and interviewing them for the practices of Supply Chain Risk Management in their organizations. As very renowned organizations cannot be contacted directly so in such cases secondary data was used i.e previous case studies and conclusions are drawn.
- ❖ **DATA ANALYSIS & INTERPRETATION:** The data collected after surveying a total of about 50 companies was interpreted to understand their supply chain risk management process and its financial aspects. The detailed interpretation is done of the data collected and analysed.

Design:

When deciding the research approach for a study, the researcher can choose between several approaches, all characterized by specific strengths and weaknesses. The most important condition for choosing an appropriate approach is to identify the type of research questions that should be answered. Yin (1994) presents five different types of questions; —whol, —whatl, —where, —how, and —why—questions.

. Three main characteristics distinguish a survey approach from other approaches such as case studies or experimental studies. First, the collection of information is done by asking questions to people in a structured manner. Collection methods in a survey approach could be mailed questionnaires, interviews face to face, or telephone calls. Second, a survey approach is a quantitative method that demands standardized information from and/or about the studied subject, e.g. individuals, groups or organizations. Third, information is generally gathered

from a sample, which is a fraction of a specific population. The sample should be chosen in such a manner that the answers from the sample can be generalized to the whole population. (Pinsonneault & Kraemer, 1993; Malhotra & Grover, 1998)

In this report a suitable method to collect the empirical material was a questionnaire which was mailed to logistics managers. Since the purpose of this study is to describe logistics collaboration, i.e. to describe a situation, it is important that the chosen method can reach many potential respondents. This is typical of a mailed questionnaire and is also a rather cheap way of conducting a survey.

Depending on its purpose, three different kinds of survey research are presented in research literature; explorative, descriptive, and explanatory surveys. Again, in accordance with the purpose and research questions in this study, the questionnaire in this thesis can in the first place be characterized as a explorative survey.

Preparation of a questionnaire:-

Constructing a questionnaire means a thorough break down procedure starting with the purpose and ending with a number of questions that are possible for a respondent to answer in a questionnaire (Forza, 2002). The breakdown procedure in this study should be regarded as a translation of the theoretical concepts and ideas presented in the frame of reference into concrete questions. As stated above all the questions in the questionnaire have their origin in the SCM and SCRM literature and can therefore be related back to existing literature about SCM and SCRM practices. This means that the empirical material can be compared with existing literature in order to investigate e.g. what parts that really are applied in existing collaborations.

CHAPTER-4

CASE STUDY

4.1 Introduction to the case

The current research study was taken up in order to fulfil the project dissertation as required by the university curriculum. The study took almost 4 months in total beginning with the finalization of the objectives and the scope. The literature review took almost three weeks while the questionnaire preparation took almost 12 days and the data collection took almost 5 weeks.

The findings of the study gave the insights into the way today's courier companies manage their supply chain and how they take into consideration the supply chain risk management.

In cities, there are often bicycle couriers or motorcycle couriers but for consignments requiring delivery over greater distance networks, this may often include Lorries, railways and aircraft.

Many companies who operate under a Just-In-Time or "JIT" inventory method often utilise onboard couriers. On-board couriers are individuals who can travel at a moment's notice anywhere in the world, usually via commercial airlines. While this type of service is the second costliest general aviation charters are far more expensive—companies analyze the cost of service to engage an on-board courier versus the "cost" the company will realise should the product not arrive by a specified time (i.e. an assembly line stopping, untimely court filing, lost sales from product or components missing a delivery deadline, organ transplants).

Global trade boom and sudden upsurge of e-commerce market is significantly boosting the courier market in India. The service is distinctive by its premium services like speed, security, tracking, signature, committed delivery time and specialized & individualized service in comparison normal postal services. Some of the key drivers of the industry include global trade boom, growth in e-commerce, financial institutions dependence on courier, growing business of private telecom sector and seasonal business upsurge due to occasions. The e-commerce delivery market is growing at over 50 per cent, giving rise to start-up companies. E-commerce logistics needs more tech platforms which can track shipments right from the time a buyer clicks to pay, to the delivery

4.2 Data Collection Techniques

As far as the data collection techniques are concerned, a mix of quantitative and qualitative techniques was made use of. A mix of convenience and snowball sampling was used. The preparation of the questionnaire in itself proved to be a cumbersome task because of the variety of aspects that had to be included in final study.

Layout of the questionnaire:-

The final version of the questionnaire is divided into four main sections where the first two sections deal with the inbound and outbound supply chain questions about the respondent's company and their logistics process approach. It included the receiving the parcel as well as sending of the parcel from the courier hub to its destination. Various factors involved in inbound and outbound logistics and the communications were included in the questionnaire.

The next section included the questionnaire about the role of IT (Information Technology) in the business process for the courier industries. All the factors which make the business for the courier industry efficient were included.

Fourth section included questionnaire based on the Risk Identification in the company. The whole idea was to find out as to what types of risks are prevailing in the courier industry. The questionnaire was focused on the probability of occurrence and negative impact of different risks. The risks were classified as internal and external risks and then their analysis was done.

Final section was dedicated to Supply Chain Risk Management and Assessment process being followed in the company. In this the stage of company in terms of SCRM practices usage was identified.

4.3 Data analysis

Inbound supply chain

Response

All the respondents gave answers of these direct questions related to inbound supply chain. The response of these questions is as follows. These questions helped in the knowing how strong and how efficient their inbound logistics is.

1) How many parcels do your company receives every day?

200-400	400-600	600-800	More than 800
15	20	10	5

2) How many authorized dealers are available in the city for the company?

10-20	20-30	30-40	40-50
8	17	13	12

3) How many numbers of area hubs are available in the city?

Less than 5	5-7	8-11	more than 11
0	7	35	8

4) How are the receipts generated at the authorized dealer while receiving the parcel?

Computerized receipts	Manual Receipts
31	19

5) How are the parcels brought from the authorized dealer to the area hub?

Motorbikes Small	Truck Page
32	18

6) How many trips in a day are made for collecting parcels from the authorized dealers?

1 trip	2 trip	3 trip	4 or more than 4 trip
7	35	8	0

7) Total Numbers of vehicles which are available to collect the parcels from the dealers?

1-5	5-10	10-15	15-20
12	30	5	3

8) What are the numbers of employees working in the area hub?

< 5	5-10	10-15	more than 15
0	8	15	27

9) On an average how long does it take to do the segregation of parcels from different location prior to dispatch?

15-30 min	30-45 min	45-60 min	more than 60 min
10	20	15	5

Analysis:-

The analysis of this response is as follows:

The ability to handle huge number of parcels could be attributed to better value chain increase number of customer base and incorporation of information technology.

The courier companies are trying to increase their customer network throughout the city. More number of authorized dealers means better service to the customer and addition of more number of customers.

Area hubs can be defined as a centralized location of a courier company in a location from where it can collect/distribute parcels in and around the location. More numbers of area hub could lead to better collection and distribution network and better customer satisfaction.

Majority of the authorized dealers use automated computerised receipts to give to customers this could be attributed to the fact that majority of the dealers are not willing to use computer as it helps improve efficiency and remove redundancy of data.

More number of courier company's prefer to use motorbikes to bring the courier parcel from its authorized dealer to its area hub, the main reason for the use of motorbikes is its cheap and easy to maintain compared to a small truck. Also motorbikes give a good mileage compared to a small truck. Motorbikes can even go to locations where small trucks can't enter.

Majority of the courier operators have two trips per days to bring the parcels from its various authorized distributors, one trip in the morning and the other in the evening. The reason for having 2 trips can be attributed to the fact that it gives sufficient time for the dealers to get more parcels to deliver when the next vehicle comes for pick up. More of the courier company limit their pick up up to 2 trips per day as it is more economical.

More number of courier operators possesses around 5 to 10 number of vehicles which included both 2 wheelers as well as 4-wheelers. The total number of vehicles are decided by the courier company on the basis of the location of the area hub , numbers of the authorized distributors, number of parcels received/dispatch in a day, number of employees etc. therefore on an average we can see that for each of the area hub the number of vehicles ranges from 5 to 10.

More number of courier operators has employee strength of more than 15, it is due to the fact that it is a people management industry where majority of the work is done by the human resource. More number of employees refers to better management of the parcels, quicker delivery of the parcels and other benefits

The segregation of the parcels in a particular area hub is carried out in an average time of about 30 to 45 min. The segregation process includes the differentiation of various parcels on the basis of the type, location, state, country etc. the segregation is made much easier with the use of bar code machine which could read each of the parcels and segregate it.

Outbound supply chain

Response

These were also elementary questions to understand the supply chain process of outbound logistics of the firm. These questions helped in computing the overall efficiency in the outbound logistics of these courier companies.

1) How many vehicles are available to dispatch the parcels to the destinations?

1-5	5-10	10-15	15-20
12	30	5	3

2) Does your company outsource the logistics to a third party vendor?

Yes	No
8	42

3) How many trips of vehicle are made for the dispatch of parcels in a day?

1 trip	2 trip	3 trip	more than 4 trip
7	35	8	0

4) Is the facility for tracking the package available online?

Yes	No
50	0

5) On an average how many days does it take to send a parcel anywhere in India?

1 day	2 days	3 days	more than 4 days
7	35	5	3

6) On an average how many days does it take to send a parcel outside India?

Less than 3 days	3-5 days	5-7 days	more than 7 days
0	3	10	37

7) What kinds of vehicles are used to dispatch the parcel destination area hub to the customer address?

Motorbikes	Small trucks
45	5

Analysis

The response for first question related to number of vehicles was quite same for almost all firms. More number of courier operators possess around 5 to 10 number of vehicles which included both 2 wheelers as well as 4-wheelers. The total number of vehicles are decided by the courier company on the basis of the location of the area hub , numbers of the authorized distributors, number of parcels received/dispatch in a day, number of employees etc. therefore on an average we can see that for each of the area hub the number of vehicles ranges from 5 to 10.

Majority of the company do no outsource their logistics to a third party vendor, the main reason being courier company have better control of the vehicles as the courier industry is fully dependent upon the logistics part, therefore the company's do not want to compromise on the issues which could result with third party company if it outsource

Majority of the courier operators have two trips per days to bring the parcels from its various authorized distributors, one trip in the morning and the other in the evening. Reason is same as that for inbound logistics.

Almost all the courier companies have the facility to track the package anywhere in the world with the help of internet. It is helpful for both company as well as the customer to know the status of the parcel and also eliminate the chance of any parcel getting lost.

On an average it roughly takes 2 days to send a courier to anywhere in India. The average number of days usually depends upon the availability of the vehicle, delays of vehicle, delay in processing the parcel delivery etc. The delivery of the parcel also depends upon the destination distance from the source. Close destination could even be reached within 1 day.

The average number of days for sending a parcel anywhere outside India takes more than 4 days which again is a subject the location of the country and the resources available at the right time. It also totally depends upon the use of information technology for the transport of the parcels. Most of the delivery is carried with the help of airplane as it is fast and reliable.

More number of courier company's prefer to use motorbikes to send the courier parcel to its destination, the main reason for the use of motorbikes is its cheap and easy to maintain compared to a small truck.

Role of Information Technology

Response

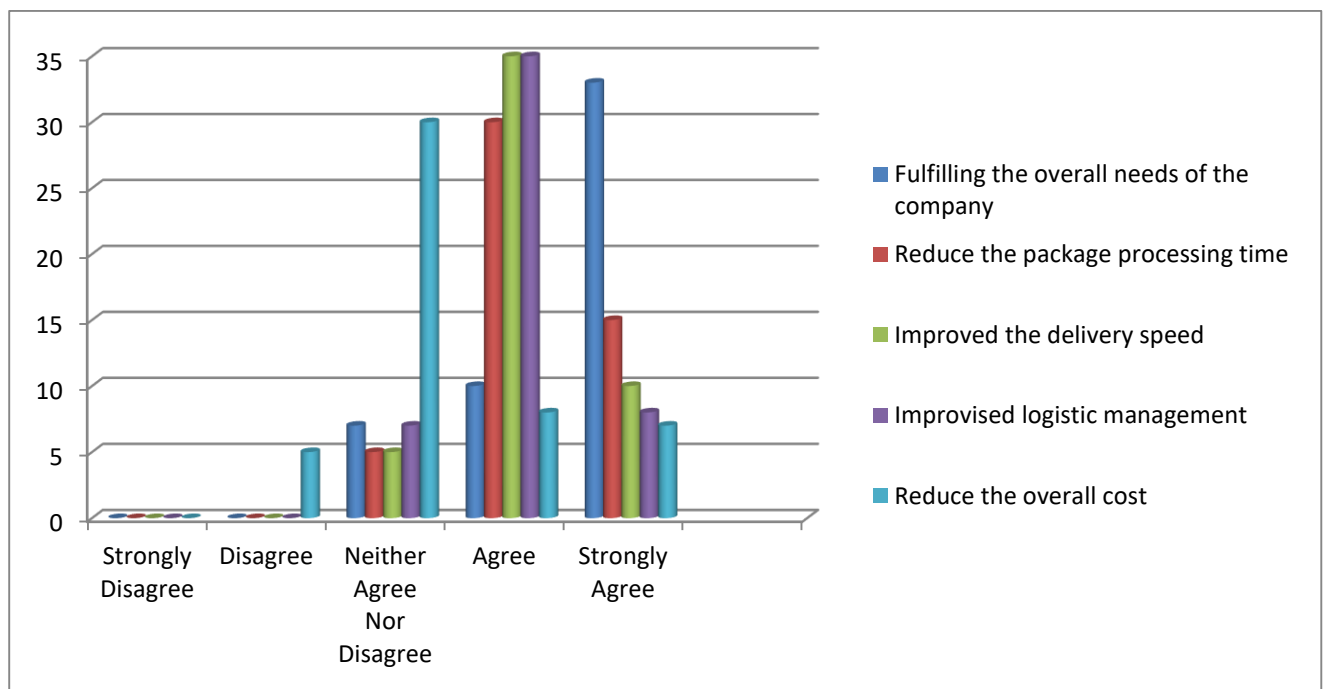
1) Does your courier company use computer application to process packages (if yes which one)?

No	Yes
0	50

2) Please rate your response on the scale of 5 (1-strongly disagree 5-strongly agree)

Has the computer application helped in?

	1	2	3	4	5
Fulfilling the overall needs of the company	0	0	7	10	33
Reduce the package processing time	0	0	5	30	15
Improved the delivery speed	0	0	5	35	10
Improvised logistic management	0	0	7	35	8
Reduce the overall cost	0	5	30	8	7



Analysis

When asked about the use of Information Technology in the process almost every company positively replied. It is quite obvious that if any firm in this era says “No” to information technology it would face so many difficulties to sustain in the business. Especially when courier industry is getting so much revenue from the E-commerce it would not be beneficial at all not to include the information technology in the process.

Analysing the above likert scale we see that majority of the company's do believe that Information technology has helped to improvise the business of the company. It has not only helped to understand the overall value chain but also helped to eliminate any non value activities.

It has also helped in package processing time by making the whole process automated with the help of Bar code being printed on the parcel. This has therefore helped to reduce the overall time which it took in a traditional manual work to a greater extent, and thus making the whole process much efficient. The courier industry also believes that the use of IT has helped to improve the delivery speed as well as improvise the logistics. By properly routing the vehicle with the use of technology of GPS Courier Company are able to reduce time cost and improvise better customer satisfaction.

Risk Identification

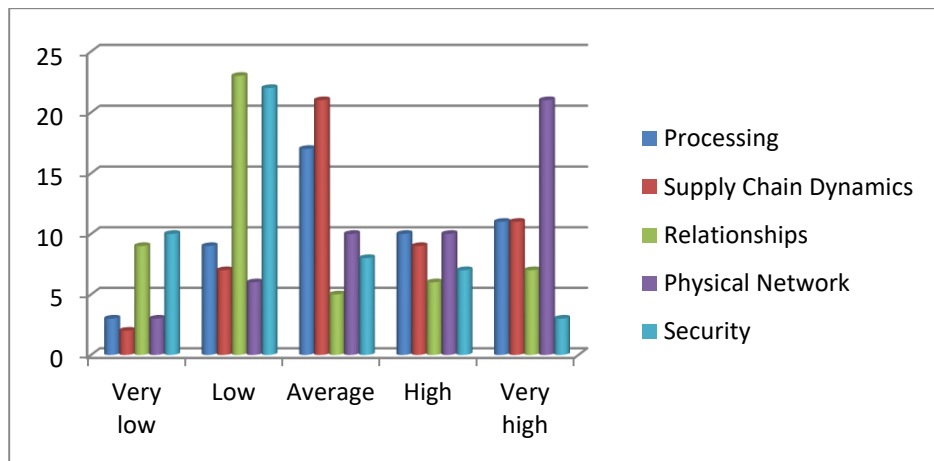
Internal Sources		Examples	Quantify each of the following risk sources in terms of Probability of occurrence (P) and potential negative Impact (I).				
Risk Factor	P		I	2	3	4	5
Process & Manufacturing	P	Growing Production Lead time (downtime), Poor Quality, Technology reliability	1	2	3	4	5
	I		1	2	3	4	5
SC Dynamics	P	SC Visibility, System Integration, Forecast Accuracy, Events Propagation	1	2	3	4	5
	I		1	2	3	4	5
Relationship	P	Single Business Partner (3PL, Suppliers, Customers, Service provider), Business Partner relative strength, Partners' credit availability	1	2	3	4	5
	I		1	2	3	4	5
Physical Network	P	Lead Time Variability, Transportation process, Damages/thefts	1	2	3	4	5
	I		1	2	3	4	5
Security	P	IT System failure, HSE rules obey, Intellectual Property, Assets Security (Warehouse, facilities, etc.)	1	2	3	4	5
	I		1	2	3	4	5
Government	P	Regulation & laws, Tax & legal, Market Protectionism	1	2	3	4	5
	I		1	2	3	4	5
Financial	P	Market instability, Currency & Exchange rate fluctuation	1	2	3	4	5
	I		1	2	3	4	5
Environmental	P	Natural disasters, Fires/breakdowns, War&Terrorism, Labour Disputes	1	2	3	4	5
	I		1	2	3	4	5

Response

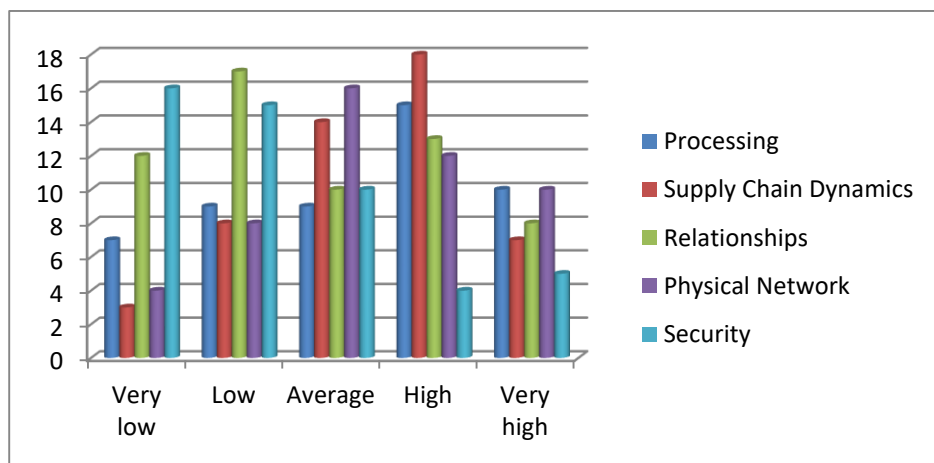
Internal Sources

	P	I	P	I	P	I	P	I	P	I
	1		2		3		4		5	
Processing	3	7	9	9	17	9	10	15	11	10
Supply Chain Dynamics	2	3	7	8	21	14	9	18	11	7
Relationships	9	12	23	17	5	10	6	13	7	8
Physical Network	3	4	6	8	10	16	10	12	21	10
Security	10	16	22	15	8	10	7	4	3	5

Probability of occurrence of Risk



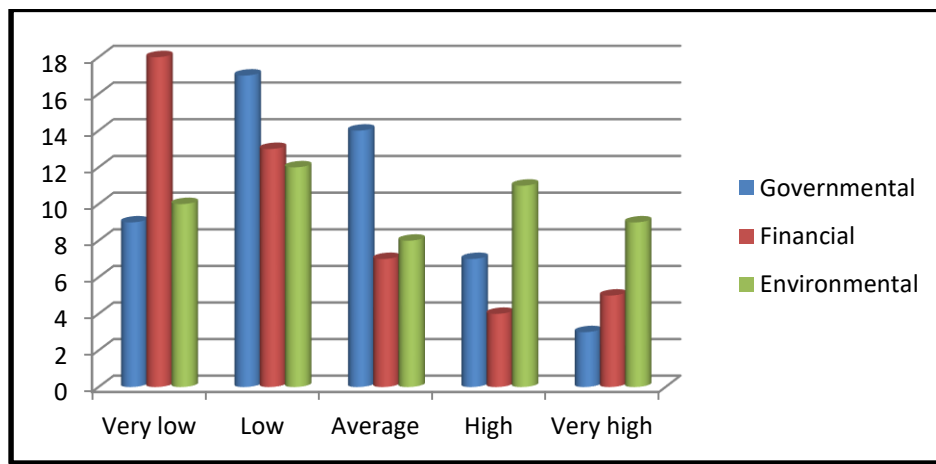
Potential negative Impact of Risk



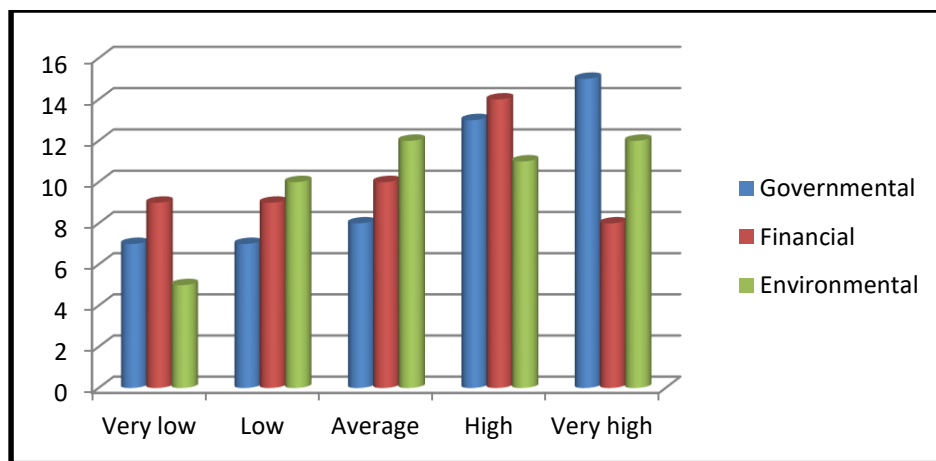
External Sources

	P	I	P	I	P	I	P	I	P	I
	1		2		3		4		5	
Governmental	09	7	17	7	14	8	7	13	3	15
Financial	18	9	13	9	7	10	4	14	5	8
Environmental	10	5	12	10	8	12	11	11	9	12

Probability of occurrence of Risk



Potential negative Impact of Risk



Interpretation:

Above charts show the probability of occurrence of different types of internal as well as external risks and also their negative impact on the supply chain of the firm. Though there is no pattern depicted, we can easily see even if the probability of occurrence of the risk is low, it usually has a high impact on the supply chain and also on the performance of the company.

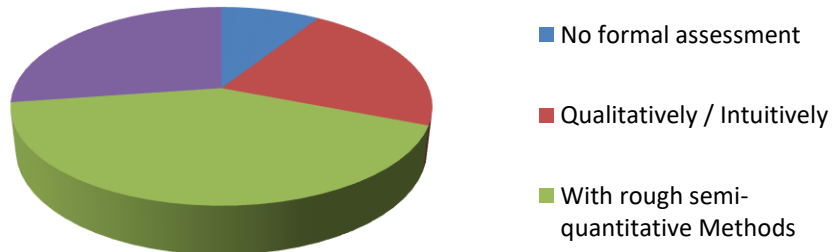
Supply Chain Risk Management and Assessment process

Response

Which of the following best describes your company's risk assessment approach?

There is no formal assessment	5
Qualitatively / Intuitively	12
With rough semi-quantitative Methods	23
With detailed quantitative methods	10

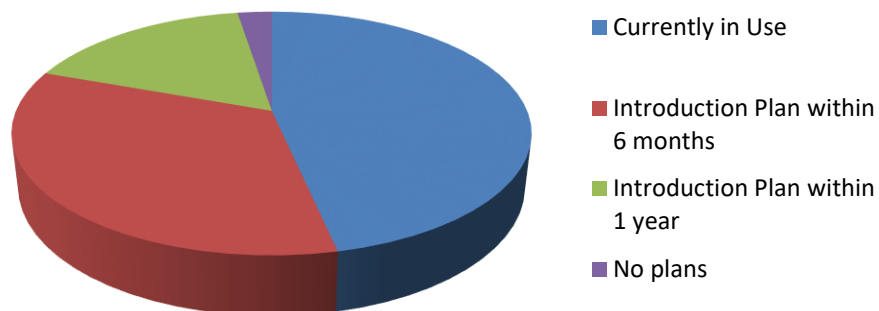
Company's Risk Assessment Approach



Which of the following best describes your company's overall use of supply chain risk management?

Currently in use
Plan to implement/evaluate within the next 6-12 months
Plan to implement/evaluate within the next 12-24 months
No plans

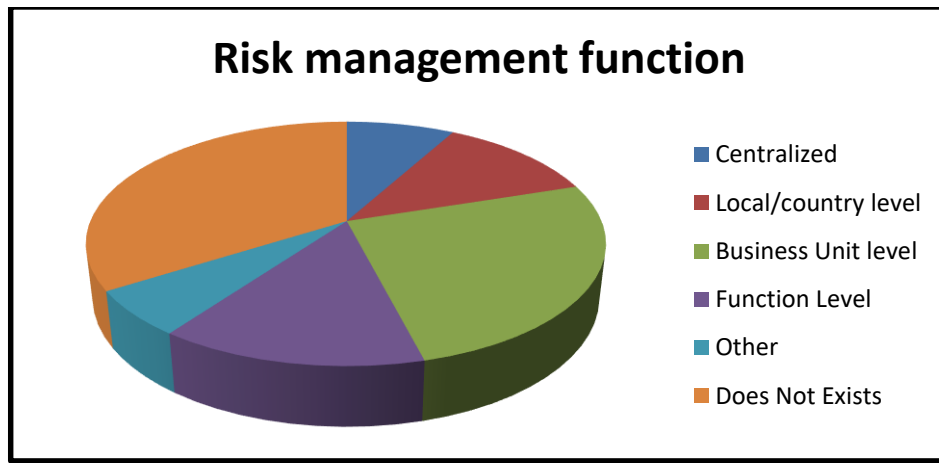
Company's overall use of SCRM



Does a formalized Risk management function exist in your organization?	Yes	No
	33	17

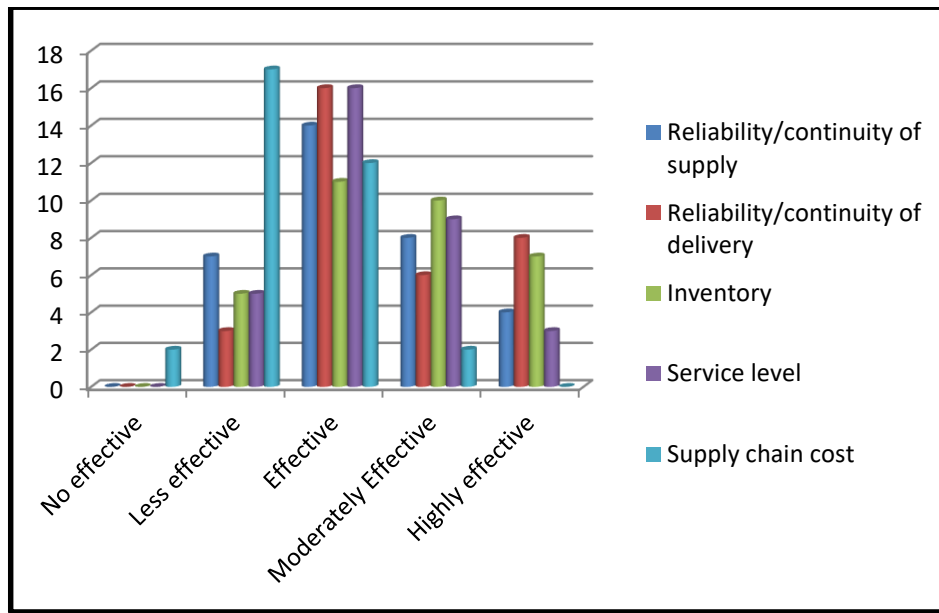
If in use, which of the following best describes your company's Risk Management organization?

Centralized	4
Local/country level	6
Business Unit level	13
Function Level	7
Other	3



Indicate the effectiveness (E) of supply chain risk management process actually in use

	1	2	3	4	5
Reliability/continuity of supply	0	7	14	8	4
Reliability/continuity of delivery	0	3	16	6	8
Inventory	0	5	11	10	7
Service level	0	5	16	9	3
Supply chain cost	2	17	12	2	0



Analysis

The interpretation of the data collected shows that almost 60 percent of the surveyed firms have a formalized Risk Management function in their organization. Next we analyse the status of this formalized risk management function in these firms. The data shows that mostly firms have the Risk management function at business level.

After knowing the level of the risk management function we also surveyed the effectiveness of this with respect to various criteria used to measure the performance of the company. The data depicts that though the risk management may not be very effective, but it is moderately effective in improving the various performance criteria of the courier company.

4.4 **Conclusion:**

From the above interpretation it can be concluded that though the courier companies in Delhi NCR are trying their best to maintain good supply chain practices both inbound as well as outbound but still these firms have not come long enough on the path of Supply Chain Risk Management. It is found from the data interpretation that only 60 percent of the surveyed companies seriously opt for supply chain risk management approach. It is also analysed that many companies not even assess the risk in their supply chain. Logistics are the backbone of any courier industry; therefore in order to improve the service time as well as the customer satisfaction, an efficient supply chain management is required. And to maintain the efficiency of the supply chain the firms should critically assess the risk of the supply chain and then chose from the best know practices of Risk Management such as ERM.

Other major Findings of the study are:-

In order to manage a large number of customers and to offer the best service almost all the courier agency works on a large scale in terms of handling and delivering thousands of parcels every day, From the respondents we can see the number of parcel handling lies around 400 to 600 parcels per day. The ability to handle huge number of parcels could be attributed to better value chain increase number of customer base and incorporation of information technology.

The importance of computer application can be understood with the fact that all the courier companies are using it to deal with the business. The computer applications has helped to better manage the whole process. It has helped to reduce the overall cost to a greater extent and also helped to automate few processes.

Information technology has helped to improvize the business of the company. It has not only helped to understand the overall value chain but also helped to eliminate any non value activities. It has also helped in package processing time by making the whole process automated with the help of Bar code being printed on the parcel. This has therefore helped to reduce the overall time which it took in a traditional manual work to a greater extent, and thus making the whole process much efficient. The courier industry also believes that the use of IT has helped to improve the delivery speed as well as improvise the logistics. By properly routing the vehicle with the use of technology of GPS courier company are able to reduce time cost and improvise better customer satisfaction.

4.5 Limitations of the study:

The research work carried to understand the various aspects of supply chain management in the courier industry gives us the snapshot of the activities carried out in the industry. Therefore the courier locations sites selected for conducting the study may not be true representation of the supply chain management carried out in various Courier company worldwide or even country wide. The data collected were from only from 50 courier agencies having hubs in different parts of Bangalore city. Further, as the concept of logistics and SCM is complex and involves a network of companies in the effort of producing and delivering a final product, its entire domain cannot be covered in just one study.

This study takes the perspective of a focal company on SCM and collaboration issues in a supply chain. It is my belief that more studies on SCM issues with a company perspective should be undertaken. This would make the research into SCM and its consequences progress.

Future research can be carried out in this field as there is a lot of scope available. One of the directions which I found interesting was to analyse the synergy between the organization and the Supply Chain Risk Management approach they opt for. There are still many uncovered areas of further studies in this field.

CHAPTER-5

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CHAPTER-6

APPENDIX

Inbound supply chain

1) How many parcels do your company receives every day?

200-400 400-600 600-800 More than 800

2) How many authorized dealers are available in the city for the company?

10-20 20-30 30-40 40-50

3) How many numbers of area hubs are available in the Bangalore city?

Less than 5 5-7 8-11 more than 11

4) How are the receipts generated at the authorized dealer while receiving the parcel?

Computerized receipts Manual Receipts

5) How are the parcels brought from the authorized dealer to the area hub?

Motorbikes Small Truck Page

6) How many trips in a day are made for collecting parcels from the authorized dealers?

1 trip 2 trip 3 trip more than 4 trip

7) Total Numbers of vehicles which are available to collect the parcels from the dealers?

1-5 5-10 10-15 15-20

8) What are the numbers of employees working in the area hub?

< 5 5-10 10-15 more than 15

9) On an average how long does it take to do the segregation of parcels from different location prior to dispatch?

15-30 min 30-45 min 45-60 min more than 60 min

Outbound supply chain

1) How many vehicles are available to dispatch the parcels to the destinations?

1-5 5-10 10-15 15-20

2) Does your company outsource the logistics to a third party vendor?

Yes No

3) How many trips of vehicle are made for the dispatch of parcels in a day?

1 trip 2 trip 3 trip more than 4 trip

4) Is the facility for tracking the package available online?

Yes No

5) On an average how many days does it take to send a parcel anywhere in India?

1 day 2 days 3 days more than 4 days

6) On an average how many days does it take to send a parcel outside India?

Less than 3 days 3-5 days 5-7 days more than 7 days

7) What kinds of vehicles are used to dispatch the parcel destination area hub to the customer address?

Motorbikes Small trucks

Role of Information Technology

1) Does your courier company use computer application to process packages (if yes which one)?

No Yes

2) Please rate your response on the scale of 5 (1-strongly disagree 5-strongly agree)

Has the computer application helped in?

	1	2	3	4	5
Fulfilling the overall needs of the company					
Reduce the package processing time					
Improved the delivery speed					
Improved logistic management					
Reduce the overall cost					

Risk Identification

Internal Sources		Examples	Quantify each of the following risk sources in terms of Probability of occurrence (P) and potential negative impact (I).					Check if you believe increasing
Risk Factor	P		I	2	3	4	5	
Process & Manufacturing	P	Growing Production Lead time (downtime), Poor Quality, Technology reliability	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
SC Dynamics	P	SC Visibility, System Integration, Forecast Accuracy, Events Propagation	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
Relationship	P	Single Business Partner (3PL, Suppliers, Customers, Service provider), Business Partner relative strength, Partners' credit availability	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
Physical Network	P	Lead Time Variability, Transportation process, Damages/thefts	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
Security	P	IT System failure, HSE rules obey, Intellectual Property, Assets Security (Warehouse, facilities, etc.)	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
Government	P	Regulation & laws, Tax & legal, Market Protectionism	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
Financial	P	Market instability, Currency & Exchange rate fluctuation	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	
Environmental	P	Natural disasters, Fires/breakdowns, War&Terrorism, Labour Disputes	1	2	3	4	5	<input type="checkbox"/>
	I		1	2	3	4	5	

Supply Chain Risk Management and Assessment process

Which of the following best describes your company's risk assessment approach?

There is no formal assessment

Qualitatively / Intuitively

With rough semi-quantitative Methods

With detailed quantitative methods

Which of the following best describes your company's overall use of supply chain risk management?

Currently in use

Plan to implement/evaluate within the next 6-12 months

Plan to implement/evaluate within the next 12-24 months

No plans

Does a formalized Risk management function exist in your organization?

Yes

No

If in use, which of the following best describes your company's Risk Management organization?

Centralized

Local/country level

Business Unit level

Function Level

Other (specify)

Indicate the effectiveness (E) of supply chain risk management process actually in use

1

2

3

4

5

Reliability/continuity of supply

Reliability/continuity of delivery

Inventory

Service level

Supply chain cost