AN ANALYSIS OF GLOBAL SUPPLY CHAIN RISKS IN SMALL AND MEDIUM-SIZED ENTERPRISES

Thesis submitted to the Institute of Social Sciences

in partial fulfillment of the requirements

for the degree of

Master of Arts

in

Management

by

Ayhan ULUOCAK

Fatih University

February, 2015

APPROVAL PAGE

Student **:** Ayhan ULUOCAK
Institute **:** Institute of Social Sciences
Department **:** Management
Thesis Subject **:** An Analysis of Global Supply Chain Risks in Small and Medium-Sized Enterprises
Thesis Date **:** February, 2015

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Arts.

Prof. Dr. Halil ZAİM
Head of Department

This is to certify that I have read this thesis and that in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts.

Assist. Prof. Dr. Mehmet BASTI
Supervisor

Examining Committee Members

Assist. Prof. Dr. Mehmet BASTI .....

Assoc. Prof. Dr. Ali COŞKUN .....

Assoc. Prof. Dr. Mustafa ÖZTÜRK .....

It is approved that this thesis has been written in compliance with the formatting rules laid down by the Graduate Institute of Social Sciences.

Prof. Dr. Mehmet KARAKUYU
Director

AUTHOR DECLARATIONS

1. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

2. The program of advanced study of which this thesis is part has consisted of:

i) Research Methods course during the undergraduate study

ii) Examination of several thesis guides of particular universities both in Turkey and abroad as well as a professional book on this subject.

Ayhan ULUOCAK

February, 2015

ABSTRACT

Ayhan ULUOCAK **February 2015**

AN ANALYSIS OF GLOBAL SUPPLY CHAIN RISKS IN SMALL AND MEDIUM-SIZED ENTERPRISES

The main purpose of this thesis is to analyze the global supply chain risks that small and medium enterprises (SMEs) may face and investigate the perceptions and attitude of SMEs towards the strategies to avoid or mitigate those risks. SMEs are known as the backbone and the driving force of Turkey's economy. Due to the fact it is very time consuming and costly to observe the high number of SMEs, A sampling was decided. The sample of the research is the 62 SMEs from different parts of Turkey. To be able to comprehend the perceptions and attitudes of the SMEs toward global supply chain risks, a questionnaire with 5 sections and 59 questions was administered.

The Statistical Package for the Social Sciences (SPSS) version 22 was used to analyze the data. The distribution of companies for demographic characteristics, the personal data of the representatives of the companies were examined. The practice of the companies about global supply chain risk management, and their approach to manage risks were analyzed. Cross - Tabulation and Chi-square test were applied to determine the existence of statistical relationships between demographic characteristics of the companies and the questions.

Key words: global supply chain risk, global supply chain risk management, mitigate, small and medium enterprises,

KISA ÖZET

Ayhan ULUOCAK **Şubat 2015**

KÜÇÜK VE ORTA ÖLÇEKLİ İŞLETMELERİN GLOBAL TEDARİK ZİNCİRİNDE KARŞILAŞTIKLARI RİSKLERİN ANALİZİ

Bu tezin amacı küçük ve orta ölçekteki işletmelerin faaliyetlerinde; global tedarik zincirinde karşılaştıkları riskleri analiz etmek ve bu risklerden kaçınma ya da riskleri azaltmaya yönelik algı ve yaklaşımlarını incelemektir. Küçük ve orta ölçekteki işletmeler Türkiye ekonomisinin belkemiği ve itici gücü olarak bilinmektedir. Tüm işletmelerle görüşülmesi zaman ve maliyet açısından zor olduğundan örneklem grubunu Türkiyenin farklı bölgelerinde faaliyet gösteren küçük ve orta ölçekteki 62 işletme oluşturmaktadır. 5 bölümden ve toplamda 59 sorudan oluşan anket yoluyla global tedarik zinciri riskleri ve global tedarik zinciri risk yönetimine bakış açıları (yaklaşımları) incelenmiştir. Elde edilen veriler SPSS Statistics 22 programı ile analiz edilmiştir.

İşletmelerin demografik yapıları, anketi dolduran işletme yetkililerine ait şahsi veriler, işletmelerin global tedarik zinciri riskleri ve global tedarik zinciri risk yönetimine bakış açıları ile ilgili dağılımları incelenmiştir. İşletmelerin demografik yapıları ile soruların arasında istatiksel bir ilişkinin varlığını tespit etmek amacıyla Cross-Tabulation analizi ve Ki-Kare testi uygulanmıştır.

Anahtar Kelimeler: küçük ve orta ölçekli işletmeler, tedarik zinciri, global tedarik zinciri riskleri, global tedarik zinciri risk yönetimi,

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
GSCM	Global Supply Chain Management
GSCRM	Global Supply Chain Risk Management
HP	Hewlett Packard
IBM	International Business Machines
KOSGEB	Small Industry Development Organisation
LE	Large Enterprises
OECD	Organisation for Economic Cooperation and Development
SARS	Severe Acute Respiratory Syndrome
SBA	Small Business Administration
SCM	Supply Chain Management
SEGEM	Industrial Training and Development Centre
SMEs	Small and Medium Enterprises
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNESCAP	The United Nations Economic and Social Commission for Asia and The Pacific
UNIDO	United Nations Industrial Development Organization
US	United States

INTRODUCTION

Global supply chains play crucial role in the competitive environment of the business world. Global configurations of companies enable access to cheap labor and raw materials, better financing opportunities, larger product markets, the simultaneous buying and selling of goods in different markets or in derivative forms. Thus they take advantage of different prices for the same asset and additional benefits offered by host governments to attract foreign capital (Kogut and Kulatilaka, 1994).

Despite of these benefits that attract firms to go global, there are disruptions and risks that managers face in global supply chains, however. As Barry (2004) argues, "An enterprise may have lowest over-all costs in a stable world gating factors kink up an elongated global supply chain!"

There is a number of acknowledgements in the literature of the risks and uncertainties in global supply chains. Although risk management in global companies has been investigated, risk management was driven out to the background until recently when some researchers (Barry, 2004; Christopher and Lee, 2004; Juttner, 2005; Manuj and Mentzer, 2008) revived an interest in risk management, particularly in global supply chains. By understanding the variety and interconnectedness of supply chain risks, managers can apply effective risk-mitigating strategies for their companies. Hauser (2003) suggests that in today's increasingly complex environment, risk adjusted supply chain management (SCM) will yield to improved financial performance and competitive advantage. Therefore, understanding global supply chain risk management (GSCRM) is important and a top priority for both academics and practitioners.

An initial review of the literature on risk management in supply chains led to the identification of three major gaps. First, there is no ultimate definition which is enough to take into account the characteristics of risk and risk management in a global supply chain.

On the other hand, there are many definitions and concepts, and therefore, confusion between terms such as risks, uncertainties, vulnerabilities, and sources of risks. Second, strategies to address risks draw more attention (Juttner, 2005). Even though several studies provide a list of risk management strategies (Juttner et al. 2003), these studies do not tell how managers select among them, i.e. the antecedents to GSCRM strategies, and their consequences. Juttner et al. (2003) suggest investigating risk management in different supply chains and developing strategies based on their environments. Third, there is limited research on moderators of the risk management process (Manuj and Mentzer, 2008).

Small and medium enterprises (SMEs) are playing important role in any economy due to a number of unique features not held by large companies. As a whole, they compose the dominant majority of most economies' firms and jobs. Kaplinsky and Readman (2001) refer to them as the backbone of the private sector in countries both developed and developing. Secondly, SMEs play a critical role in the development process. Because of small size in hierarchy they are less bureaucratic and have less inertia.

SMEs play a very important role in the Turkish economy owing to their large share in the total number of enterprises and in total employment. In general, SMEs do not contribute much to exports. Despite their efforts, however, there is little evidence that industrial SMEs are increasing their share of exports in most countries. Many small companies already find it very difficult to establish themselves on the domestic market. This is certainly true of Turkey, which is a relatively large country in terms of both population and geography and where the average size of SMEs is quite small. The lack of study about GSCRM and SMEs in Turkey has led the emergence of this research.

In view of these gaps, the purpose of this thesis is to take a step to analyze global supply chain risks that SMEs in Turkey encounters and investigate the approach of SMEs towards risk mitigation strategies. A

quantitative research design was chosen. Based on the analysis of quantitative survey, a model of risk management strategies in global supply chains is developed. It is important to mention that the context in this qualitative study was exporting or importing companies. This research is organized as follows: In the first chapter concept of global supply chain and global supply chain management (GSCM) is developed. It is followed by the broad information about SMEs in the world and in Turkey. In the last part of the first chapter the relationship between global supply chain management and SMEs are studied. In the second chapter definitions of global supply chain risks and GSCRM are developed. Types of global supply chain risks are given in details. In addition, the interaction of different risks in the global environment is explored. Broad descriptions of risk management strategies are provided and important points prior to strategy selection are discussed. In the third chapter research methodology and the survey conducted on some selected SMEs in Turkey are explained. The findings of the survey are analyzed and lastly in the fourth chapter crucial conclusions are drawn and recommendations are presented for future studies.

CHAPTER 1

1. GLOBAL SUPPLY CHAIN AND GLOBAL SUPPLY CHAIN MANAGEMENT

1.1. GLOBAL SUPPLY CHAIN CONCEPT

Supply chains appeared when issues associated with materials flow were first introduced. Since the 1990s, the term increased its popularity, together with its corresponding concept of SCM, introduced by consultants in the 1980s (Arshinder and Deshmukh 2008; Chen and Paulraj 2004). Among its many origins, Chen and Paulraj (2004) point to five, in particular, when explaining this trend:

- The quality revolution;
- Concepts of materials management and integrated logistics;
- A growing interest in industrial markets and networks;
- The concept of increased focus; and
- Influential industry-related studies.

Supply chain has been confusingly associated with a variety of definitions in its usage. Common among these definitions is the existence of an input-output structure covering a range of value-adding activities (Gereffi et al. 2001). Sturgeon (2001) suggests that supply chains are limited to the set of activities that are driven by a lead company. According to Sturgeon (2001) lead firms usually initiate the flow of new products through the supply chain and help drive the firm and geography of their supply base by demanding that their suppliers take part in new activities and invest in new places.

There are numerous definitions made by authors. According to La Londe and Masters (1994) supply chain is a set of firms that pass materials. Another definition of is made by Lambert et al. (1998) about global supply chain, as the alignment of firms that brings products or services to market forward.

As for Christopher (1992), "a global supply chain is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services delivered to the ultimate consumer."

Mentzer et al. (2001) define global supply chain as a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer.

Prior to the rapid changes of its concept, supply chain was engaged with the flow of goods from supplier to manufacturer, distributor, and customer, but Steven expanded this scope further upstream to the source of supply and down to the point of consumption. (Cooper et al. 1997). Furthermore, Mentzer et al. (2001) remark that "any organization can be part of numerous supply chains. Wal-Mart, for example, can be part of the supply chain for candy, for clothing for hardware, and for many other products. This variety of supply chain phenomenon begins to explain the network nature that many supply chains possess. For example, AT&T might find Motorola to be a customer in one supply chain, a partner in another, a supplier in a third, and a competitor in still a fourth supply chain." According to Mentzer et al. (2001) supply chain can be classified into three degrees to clarify the above mentioned complexity. These are namely a "direct supply chain," an "extended supply chain," and an "ultimate supply chain". A "direct supply chain" encapsulates the focal firm and its immediate suppliers and customers. An "ultimate supply chain" includes all the organisations involved upstream and downstream relative to the focal company until the ultimate suppliers and ultimate consumers are reached. Anything in between the direct supply chain and ultimate supply chain in scope can be referred to as an "extended supply chain" (Mentzer et al. 2001).

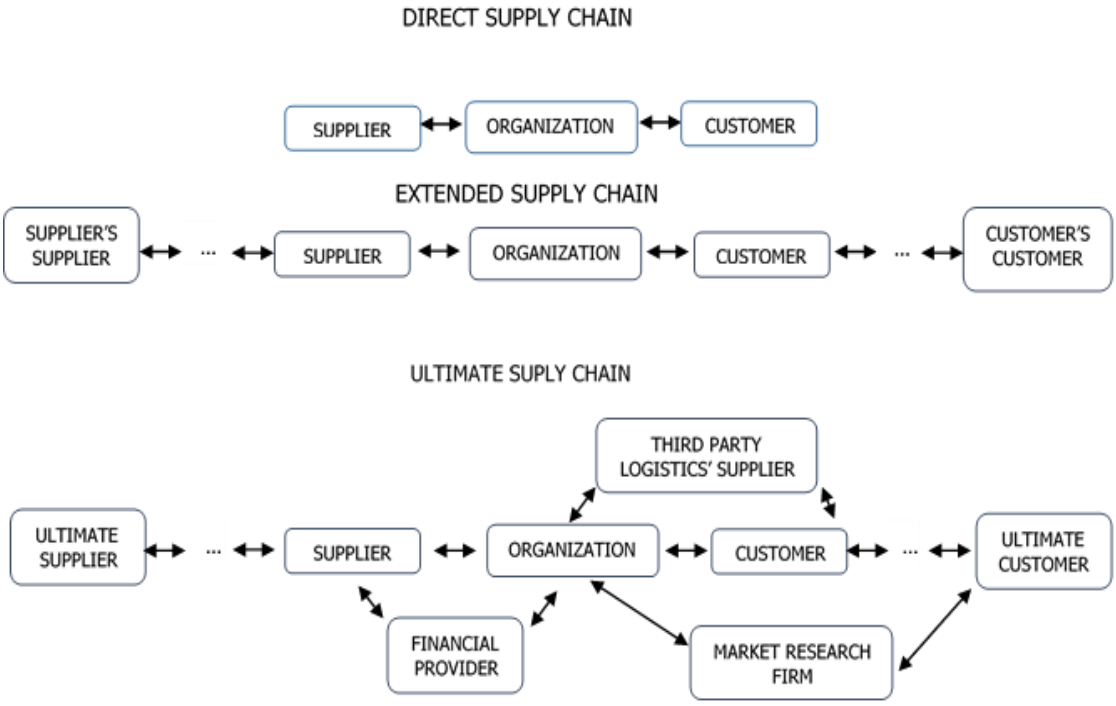

FIGURE 1. CLASSIFICATION OF THE ORGANISATIONAL SCOPE OF GLOBAL SUPPLY CHAINS

Source: Mentzer et al. (2001)

1.2. GLOBAL SUPPLY CHAIN MANAGEMENT

The concept of global supply chain management introduced first by consultants was born in the early 1980s. Later on it received tremendous attention. In the early 1990s, academic research started following supply chains and tried to establish some theoretical structure (Cooper et al. 1997).

Mentzer et al. (2001) advocate the idea that Forrester identified key management issues and illustrated the dynamics of factors associated with the phenomenon referred to in modern business literature as SCM.

Forrester is commonly cited for introducing key ideas on industrial dynamics, physical distribution, and transportation in the late 1950s and early 1960s (Mentzer et al. 2001; Cooper et al. 1997). Forrester (1958:37) states that management is on the verge of a breathtaking development in

understanding how a company could achieve depending on the interactions between the flows of information, products, finance, labor, and capital equipment. The way these five flow systems interact to strengthen one another and to cause change and fluctuation will construct the basis for anticipating the effects of decisions, policies, organizational forms, and investment choices.

There are many reasons as to why the need for GSCM arose. The fierce competition between the companies as the globalization of the world, global sourcing, quality and just in time delivery demands by the customers, uncertainty of the environment are some of the drivers for the enterprises to establish GSCM to streamline the suppliers in the chain for the smooth flow of materials, information and financial flows.

GSCM requires strong relationship, integration and trust among different tiers in the chain.

The rise of GSCM by the late 1980s and its tangible form of so many concepts gave birth to a problem of definitions in the 1990s. Literature from this period tells that the term is used so often that the meaning is lost (La Londe and Masters 1994; Mentzer et al. 2001).

Furthermore, GSCM was only rising as a concept of real relevance and as a popular topic (Cooper et al. 1997; Mentzer et al. 2001). The late 1990s gave rise to the recognition that broader definitions and conceptual frameworks on GSCM were necessary. This period saw much integration and maturation of GSCM in theoretical form.

For example, whereas the Council of Logistics Management viewed GSCM as a type of inter-firm logistics in 1986, they revised their definition in 1998 to declare logistics management as a subset of GSCM.

As for the definition, Stadtler (2005) and Mentzer et al. (2001) both describe GSCM as follows: "GSCM is the task of integrating organizational units along a global supply chain and coordinating materials, information and

financial flows in order to fulfill ultimate customer demands with the aim of improving competitiveness of the supply chain as a whole."

Mentzer et al. 2001 defines GSCM as the systematic and significant coordination of the business functions and the strategies through these business functions within a particular company and across the supply chain, for the objectives of improving the long-term performance of the individual companies and the supply chain in general.

These definitions and their predecessors view the target subject of GSCM as the supply chain, consisting of two subcomponents:

- The companies which form the structure of the supply chain, and
- The processes that form the flow within the supply chain.

The purpose of GSCM is to increase competitiveness of the supply chain through improved customer service. The perspective is obviously network-based, attaching significance not only to the firm's "nodes" that compose sectors of the international economy, but also to the relationships between those nodes. As Burgess et al. (2006) note, the operational concepts in GSCM tend to be classified into general categories or constructs. Some of the constructs are given in the following Table 1.

TABLE 1. CLASSIFICATION OF OPERATIONAL CONSTRUCTS FOR SUPPLY CHAIN MANAGEMENT

Burges et al. (2006)	soft constructs	leadership
		intra-organizational relationships
		inter-organizational relationships
	hard constructs	logistics
		process improvement orientation
		information systems
		business results and outcomes
Stadtler (2005)	integration of organizational units	choice of partners
		network of organizations
		leadership
	coordination of flows	information and communication technology
		process orientation
		advanced planning
Chen and Paulraj (2004)	environmental uncertainty	
	customer focus	
	top management support	
	supply strategy	Competitive priorities
		Strategic purchasing
	information technology	
	supply network structure	

Source: Park et al. (2013)

1.3. GLOBAL SUPPLY CHAIN MANAGEMENT FOR SMALL AND MEDIUM ENTERPRISES

1.3.1. The Definition and Significance of Small and Medium Enterprises

The description of SMEs differs from country to country. Classification is universally divided between SMEs and larger enterprises (LEs). Classification is determined by the number of employees in a company, and the range of employee cut-offs is presented in Table 2. Table 3 shows further example definitions from South-East Asia (UNESCAP 2009).

TABLE 2. A SAMPLING OF THE SME FIRM SIZE CRITERIA SURVEYED IN THE LITERATURE

Number of Employees	Geography	Source(s)
<200	Norway, Wales, Scotland	Quayle (2003), Wagner et al. (2003), Vaaland and Heide (2007)
<250	United Kingdom	Wynarcyzk and Watson (2005)
<500	United States	Hong and Jeong (2006)
≤500	United States, Mexico, Europe	Arend and Wisner (2005), Fawcett et al. (2009)

Source: UNESCAP (2009)

United States of America tends to adopt the cut-off at 500 employees or fewer adopted by the US Small Business Administration (US SBA 2008).

European countries tend to make use of smaller cut-offs of either less than 200 or 250 employees to qualify as an SME. Any firm above the size threshold is automatically classified as an LE.

TABLE 3. A SAMPLING OF SME DEFINITIONS IN SOUTH-EAST ASIA

Country	Definition
Cambodia	Firms that employ between 11 and 50 employees and fixed assets of $50000 to $250,000 are categorized as small. Firms with 51-200 employees and fixed assets of $250,000 to $500,000 are medium sized.
Indonesia	Fewer than 100 employees
Malaysia	Depends on the business sector. Different criteria, based on the number of employees and annual sales turnover.
Philippines	Fewer than 200 employees, and less than P 40 million in assets
Thailand	Depends on the business sector. Different criteria, based on number of employees and fixed capital size.
Vietnam	SMEs are independent production and business establishments that are duly registered according to the current law provisions, each with registered capital not exceeding VND 10 billion or annual labor not exceeding 300 people.

Source: UNESCAP (2009)

It should also be noted that SMEs involve very different concepts depending on whether the term is used in a developed or developing country context. In the former, SMEs are perceived to be innovative and active firms that employ high skill labour. In the latter, SMEs are perceived as firms that employ high work force but low skill labour.

Poor economic conditions and recession in the World around 1970's had negative effects on big companies. Due to their huge size they were not easily able to adopt the sudden fluctuations and changes in economies. This gave birth to SMEs for they have more flexible structure than their LE counterparts. Since 1970's their number have tremendously increased due to their adoptability and agility.

SMEs are playing important role in any economy due to a number of unique features not held by LE counterparts. As a whole, they compose the dominant majority of most economies' firms and jobs. Kaplinksy and Readman (2001) refer to them as the backbone of the private sector in countries both developed and developing. Secondly, SMEs play a critical role

in the development process. Because of small size in hierarchy they are less bureaucratic and have less inertia.

In most economies, SMEs account for more than 90 per cent of total firms and more than 50 per cent of jobs, sales, and value-added (UNCTAD 1993). Worldwide, SMEs represent 90 per cent of all firms and 50 to 60 per cent of all employment on average. The proportion of global employment represented by SMEs rises to 80 per cent when narrowed down to the global manufacturing sector (Kaplinsky and Readman 2001). In the US manufacturing sector,

SMEs represent 98 per cent of all firms and two-thirds of all jobs (Fawcett et al. 2009). In the UK, SMEs account for approximately 50 per cent of total GDP and nearly 70 per cent of all jobs. Within Wales, this number increases to 90 per cent of all Welsh jobs, with SMEs representing 80 per cent of all Welsh firms (Quayle 2003). SMEs also play a significant role in Turkey, where SMEs composes 99.5 per cent of all firms and 61.1 percent of all jobs (Koh et al. 2007).

SMEs play key roles as job generators, innovators and exporters as well. Not only do they act as a source of future LEs, but they also fill economies with adaptability. According to UNCTAD (1993), SMEs have smaller management teams that produce responsiveness, and contribute to job creation and innovation. SMEs even make consumer choice increase by entertaining minor consumer demands that would normally be neglected by LEs that are after economies of scale.

There are two important reason why SMEs are considered key actors in a country's development.

First is their ability to create jobs for low-skilled labour that is commonly found in the human resources of developing countries. This employment introduces opportunities for decreasing poverty and human resource development.

Second, SMEs help build the economic foundations needed for development. SMEs turn labour and natural resources into capital and industrial infrastructure. SMEs are also the root from which LEs are often born, and many large enterprises in the newly industrialised economies have emerged in this way. (Kaplinsky and Readman 2001; UNCTAD 1993; UNESCAP 2009). Therefore, a well working SME sector is considered a powerful tool to help make a country's economy strong.

In general, a healthy SME sector is considered necessary for a healthy economy. SMEs make up the dominant majority of firms and jobs worldwide nowadays.

1.3.2. SMEs in Turkey

There is no single definition of SMEs either in Turkey. Definition of Small and Medium Industry Development Organisation (KOSGEB) has put in order by the law number 3624. According to this act; small scaled firms are the enterprises which have workers between 1 and 50 and operating in the manufacturing sector. Medium scaled firms are the enterprises which have workers between 51 and 150 and operating in the manufacturing sector (Çolakoğlu, 2002).

According to Treasury, SMEs are enterprises that are active in manufacturing and that have maximum 400 billion TL value of machine, equipment, facility, vehicle, movable property, except buildings and lands in their ledger records. Enterprises with workers between 1 and 9 are called micro enterprises, enterprises with workers between 10 and 49 are called small enterprises, and enterprises with workers between 50 and 250 are called medium enterprises (Çolakoğlu, 2002).

SMEs play a very important role in the Turkish economy owing to their large share in the total number of enterprises and in total employment. Their average profile is different from that of SMEs in the European Union or in most other OECD (Organisation for Economic Cooperation and Development)

countries in that their average workforce and turnover are much smaller. They also fall well behind in terms of technology, skill levels, and financial strength to support their activities, and access and ability to make use of modern technologies, particularly in the information and communications fields. They have difficulty in terms of financing their activity.

The business life in which SMEs function has been difficult for many years. The economic conditions in Turkey have made the situation particularly hard for SMEs in recent decades. The rise in inflation rate contributed an increase in public sector debt that causes a lack of confidence, a series of financial crises, a sharp rise in interest rates and depreciation of the Turkish lira. Gross Domestic Product (GDP) has fluctuated strongly, slowed down by recessions, and average growth has been very low given the Turkish economy's growth potential and its needs. In addition to these general economic difficulties, SMEs have had to deal with the initial shock of the opening of the economy and competition following the Customs Union with the European Union in 1996.

The Turkish government has been committed for several years now to stabilisation and structural reform programs, notably in the framework of agreements with the International Monetary Fund, which have been accelerated since 1999-2000. In the future, Turkey will have to follow a strict structural reform policy to acquire the high and stable growth that can narrow its per capita wealth gap with the highly developed countries. The participation of large numbers of young people into the labour market, a tremendous change of jobs from the farm sector to industry and services, and the rise of women participation in the labour market (women accounted for only 27% of the formal labour force in 2000) will require new job creation in industry and services for the years to come. From the past experience of some other countries, high demand of work will be shouldered by SMEs.

Continuation of an economic policy that can keep on strong growth in an atmosphere of stability is an essential requirement for the development of

SMEs. SMEs are not as strong as larger firms to protect themselves from internal and external shocks. But it is also the development of SMEs that will make conditions more conducive to the job creation that Turkey needs for stability and growth in per capita income.

In recent years, Turkey has begun to involve a process of international integration directed towards Europe; it has established a variety of economic policies and medium and long-term economic strategies that affect SMEs either directly or indirectly because of their effective position in the economy. This process began in the 1960s and was reinforced by the general opening of the Turkish economy in the 1980s. At the same time the Turkish government developed a specific SME policy and created SEGEM and KÜSGET, which, later on, were combined under the umbrella of KOSGEB in 1990, as a major instrument for the implementation of these policies.

In most economies and in most industries, both large firms and SMEs can survive. The number of small, medium or large enterprises should be determined by market competition. The growing specialisation of modern industries often leads to a more diversified production process, with many unfinished goods assembled to produce the final product. This gives SMEs an opportunity to grow by producing highly specialised and technologically advanced parts. For example, in the modern automobile industry, only 20% to 30% of the final value added is produced by the big automobile enterprises. Moreover, if SMEs sustain in an industry in which large firms produce cheaper then they must provide something of value not provided by the larger firms.

Turkish government aims to increase the global competitiveness of SMEs in order to make them more outward-oriented and increase their level of exports. In most countries, there are SMEs whose activities are essentially export-oriented and achieve significant results, but in general SMEs do not contribute much to exports. Many governments have inferred that this is an area in which much progress can be made. Despite their efforts, however,

there is little evidence that industrial SMEs are increasing their share of exports in most countries. This is partly a matter of size. Many small firms already find it very difficult to establish themselves on the domestic market. This is certainly true of Turkey, which is a relatively large country in terms of both population and geography and where the average size of SMEs is quite small.

The Turkish government approach involves providing marketing information about demand in foreign countries and a possible government role as a facilitator to help with strategic alliances or partnerships. This may produce results, but the amount of resources used to support these activities needs to be assessed carefully to determine if these activities are productive enough. Many large firms in Europe and North America now contract out services such as data processing, payroll, employee benefits, computer maintenance, information system design, Internet servicing, advertising, training, legal support, inventory measurement and control, and product servicing. The larger firms have found that they can contract out such services and obtain both lower prices and better quality. These developments have been facilitated by the presence of smaller enterprises that draw on modern technology and their experience to develop new services. There appear to be many opportunities for this type of service business in the Turkish market. A shift of or an increase in government export support for large firms may increase exports more effectively than a focus on exports by SMEs.

1.3.3. SMEs and Global Supply Chain

SMEs are playing increasingly significant roles as actors in global supply chains. International companies regard them as important key elements for the development of a country, and agree their integration into global markets through global supply chains (UNESCAP 2009). They are already integrated as suppliers of goods and low cost labour in developing countries and as innovators and technology experts in developed countries. In addition to

being suppliers, they also act as distributors, producers, and customers in the supply chain. Therefore, SMEs take part extensively in supply chains and are expected to grow (Thakkar et al. 2008). The endurance and agility draw an increasing awareness and concern from lead firms and large enterprises on understanding and managing the SMEs in their networks (Koh et al. 2007).

On the other hand SMEs have also a number of weaknesses. Firstly they are poor in management. The owner of the company also acts as the manager of the company. They are deprived of technology and financial aid especially in developing countries. The decision making process is not healthy due to the fact that few people are involved in this process then in turn poor analysis of information. Compared to big enterprises their economies of scale are limited.

1.3.4. SMEs and Global Supply Chain Management

Because of globalisation, SMEs effectively find themselves facing more competitive business environment. Therefore, the major challenge for SMEs is to increase productivity; in other words, to produce more while using less. In order to accomplish this, the concept of global supply chain management (GSCM) should be applied to SMEs. GSCM should theoretically improve SMEs through operational excellence, enhanced learning, and new market opportunities. In Thakkar et al. (2008) own literature review, supply chain inefficiency is found to be one of the most prevalent issues confronting SMEs. Supply and process costs account for 30 per cent of the average manufacturing SME's budget, with 40 per cent of the supply costs which arises from logistics costs.

On the other hand, GSCM offers a number of benefits, including shorter lead times, fewer operational disruptions, reduced inventory, better quality and customer service, faster innovation, and reduced risk (Arend and Wisner 2005; Fawcett et al. 2009; Vaaland and Heide 2007). An empirical study by Koh et al. (2007) further explores the effect of GSCM for more than 200

Turkish SMEs, and finds evidence supporting a positive and significant effect of GSCM for SMEs.

The second benefit of GSCM is to boost learning opportunities gained by SMEs in the supply chain. By integrating into a supply chain, SMEs acquire access to stores of information, knowledge, and even training (Quayle 2003; Macpherson and Wilson 2003; Vaalande and Heide 2007).

The last benefit of GSCM is the market entry. Especially common in the SMEs and development literature, GSCM can be used by SMEs to navigate across and within supply chains in order to obtain access to new value-added activities and markets (Fawcett et al. 2009; Humphrey 2001; UNIDO 2001). With these potential benefits of GSCM, weak SMEs is able to reach potential benefits through learning and operational efficiency. Strong SMEs can use GSCM to move to positions in the supply chain that increase its value-added influence over partners (Hong and Jeong 2006; Thakkar, Kanda et al. 2008).

Given that many technological and operational innovations are found in the concepts and practice of GSCM, researchers are viewing GSCM as a potential and possibly necessary tool for SMEs to keep alive in the competition against LEs and other SMEs. In a market that gives importance to responsiveness and innovation, GSCM may be the tool SMEs need to improve their present advantages and sustainably compete in the global market.

As it is made clear in the literature, researchers are questioning the very value that GSCM can contribute to SMEs. The most important paper for this concern is Arend and Wisner's 2005 study of more than 400 senior managers, which found that "SMEs more likely to perform well chose to engage in GSCM, which was a choice that hurt SME performance."

While the idea of GSCM as a tool for dealing with the challenges of network competition is as relevant to SMEs as LEs, the design of GSCM has clearly indicated that present GSCM solutions do not align well with SME

problems. If progress is to be made on understanding how to apply GSCM for SMEs, it is argued that a shift in is needed from "SMEs as the fault" to "GSCM as the fault". For example, even Arend and Wisner (2005) state that SMEs are not suited to applying GSCM efficiently. However, studies seek to understand why SMEs are failing to implement GSCM. Instead of asking why SMEs are not suited for GSCM, however, it may be more convenient to ask why GSCM is not suitable for SMEs.

First steps have already been taken in investigating the differences between SMEs and LEs and in understanding their reflections in GSCM implementation. The next step is to transform these differences into design constraints that can then be used to develop a GSCM that is suitable for SMEs.

A future difference may need to be made between LE-GSCM and SME-GSCM. Within SME-GSCM, further differences may also be necessary between what has already been referred to as weak SMEs versus strong SMEs. As Macpherson and Wilson (2003) note, the SME sector is not homogenous, and a distinction beyond the number of employees is necessary. For example, a low-cost manufacturer in Bangladesh, a research and development specialist in Germany, and an e-commerce start-up in the US may all be SMEs but each holds a very different position with consequences in the supply chain. Fawcett et al. (2009) present one typology with regards to SME business goals. Three paths are proposed: the niche player, the grow-and-sell player, and the long-term growth player. The niche, or status quo, player is satisfied with keeping its current market niche.

The grow-and-sell player is looking to be acquired, and is concerned with establishing a strong track record to indicate the potential for future growth that will increase its valuation. The long-term growth player is to become an LE and industry leader. Hong and Jeong (2006) present a fairly advanced functional typology, assigning two measures to SMEs based on a strategic focus on supply chain position in Figure 2.

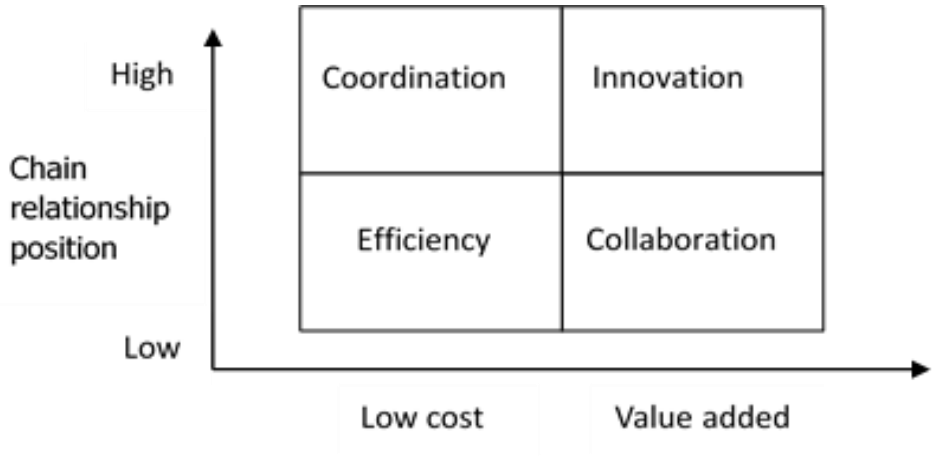

FIGURE 2. A TYPOLOGY OF SMEs

Source: Hong and Jeong (2006)

Hong and Jeong's framework further expands the weak versus strong companies differences, classifying SMEs by their current position of political power (high or low) in the supply chain and by their strategic focus (low cost or value-added) to produce four strategic roles in the supply chain (coordination, innovation, efficiency, or collaboration). This is further developed by showing five growth paths that come together on the innovative company as the ultimate goal for SMEs shown in Figure 3.

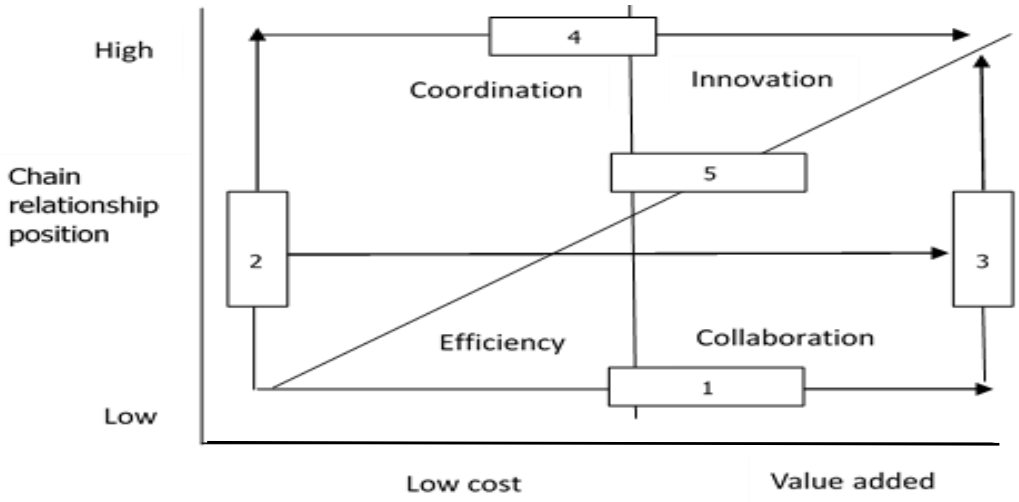

FIGURE 3. FIVE PATHS FOR SME GROWTH

Source: Hong and Jeon (2006)

CHAPTER 2

2. GLOBAL SUPPLY CHAIN RISKS AND GLOBAL SUPPLY CHAIN RISK MANAGEMENT

2.1. THE DEFINITION OF RISK IN GLOBAL SUPPLY CHAIN

Companies recently focus more on global supply chain to gain and sustain competitive advantage. On the other hand with this globalization, outsourcing, extension of supply chain, just in time supply management, lean manufacturing have caused the companies to become more vulnerable or less resilient to risks and disruptions.

Sodhi and Tang (2012) argue that there are three important reasons for the global supply chain risks. First, the extension of network in supply chain increases number of points for possible disruption. Second, the length of network decreases the visibility which causes slow decision-making and response in case of disruption. Third, local fixes create problems in part of supply chain.

In recent years, widespread impacts by the 2000 fuel protests, the 2001 outbreak of foot-and-mouth disease in the UK, the September 11 attacks, the 2003 outbreak of SARS in China and Hong Kong more recently, food security issues such as melamine contamination in infant formula and powdered milk in China gave rise to awareness of the significance of supply chain risk and have increased efforts to focus on GSCRM.

Supply chain risk is expected to continue being a major issue for both companies and governments. Technology and business model innovation will only further the gains made through trade. Sheffi (2001) points out that "enterprises are vulnerable not only to attacks on their assets, but also to attacks on their suppliers, customers, transportation providers, communication lines, and other elements in their eco-system". Given the reasons for the emergence of global supply chain risks, a definition of risk in this context should be made.

Manuj and Mentzer (2008) suggests that risk is defined as the expected outcome of an uncertain event. Knight (1921) remarked that "if you don't know for sure what will happen but you know the odds that is risk. If you don't even know the odds that is uncertainty". According to Harland et al. 2003), risk has two components:

- Potential losses (if the risk and its consequences are realized)
- Likelihood of those losses (the probability of the occurrence of an event that leads to realization of the risk)

2.2. THE CONCEPT OF GLOBAL SUPPLY CHAIN RISK MANAGEMENT

Managers in small and medium-sized enterprises should be able to identify, analyze and manage risks and disruptions from a more multiple range of sources and contexts. For the SME managers, it is hard to avoid the risks resulting from intense global competition in their home or local markets. GSCRM includes the process of identifying supply chain risks, assessing them and choosing among a range of approaches to mitigate those (Juttner et al. 2003).

Norman and Jansson (2004) defined GSCRM as the process of managing and mitigating risk through the application of risk management tools, collaboration and coordination among shareholders to enhance supply chain effectiveness and financial performance.

Manuj and Mentzer (2008) define GSCRM as the identification and evaluation of risks and their impact in the global supply chain. They also describe GSCRM as the implementation of appropriate strategies by means of coordinated approach within supply chain partners with the aim of minimizing one or more of the following – losses, probability, speed of event, speed of losses, the time for detection of the events, frequency, or exposure for supply chain outcomes that in turn direct to close matching of actual cost savings and profitability with those desired.

A simple GSCRM framework can be found in the work of Manuj and Mentzer (2008a) in Figure 4. In the next sections, steps of risk identification, risk assessment, and risk mitigation will be studied respectively.

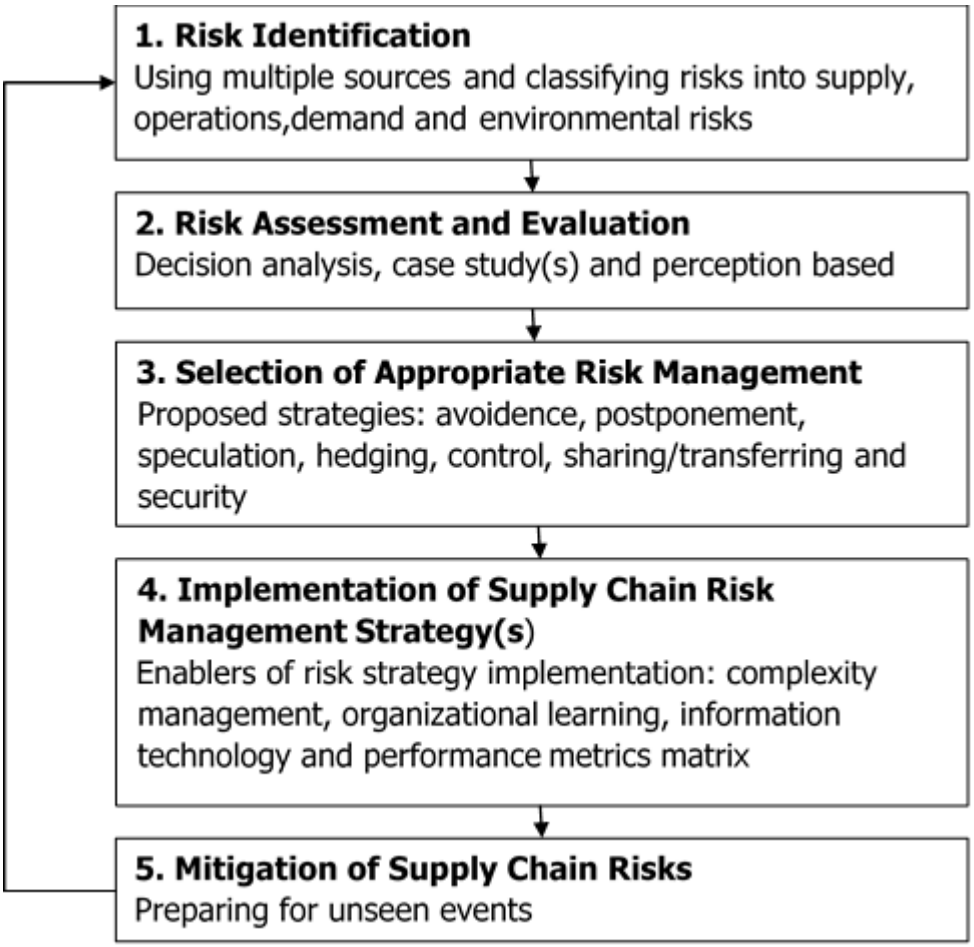

FIGURE 4. GLOBAL SUPPLY CHAIN RISK MANAGEMENT FRAMEWORK

Source: Manuj and Mentzer (2008a)

2.3. RISK IDENTIFICATION

Depending on the structure of an organization risks should be identified. Since risks arise from different sources, there is a need to classify these risks. The benefit of this classification is to help the company realize variety of risks it faces and to organise the information necessary for risk assessment and mitigation. These categories include:

a. Operational risks which arise within the focal firm,

b. Supply risks due to upstream firms (suppliers),

c. Demand risks due to downstream firms (customers),

d. Environmental risks.

There is general consensus on the definition of the first three, but some differences on the definition of environmental risks. The definitions for operational, supply, and demand risks from Christopher and Peck (2004), Juttner (2005), Sodhi and Tang (2012), and Manuj and Mentzer (2008a, 2008b) are as follows:

Operational risks are originated from the operations of the focal firm, and are subcatogarised into process risks and control risks. Process risks refer to the risks in the focal firm's set of value-added processes, such as design, manufacturing, and distribution. Control risks, on the other hand, relates to the controls used to manage processes. Internal operations are sensitive to issues which may cause fluctuations in desirable quality and capacity. For example in 2004 IBM announced that yield problems at its plant in East Fishkill, NewYork contributed to the $150 million first-quarter loss by its microelectronics division (Krazit, 2004). The lower-than-expected yields reduced the plant's effective capacity and limited IBM's ability to meet customer demand.

Supply risks negatively affect the timing, cost, and/or specifications of all inputs required by the focal firm, whether the inputs are commodities, services, or even information. These are originated from firms upstream from the focal firm. An example of a supply chain risk would be the delay on the deliveries of the raw materials. For instance; when Intercon Japan's connector manufacturer sourced a special type of bronze from a single metal supplier (Asahi Metal), Intercon Japan has very little control of the material cost (Tang 1999).

Demand risks are due to the failure to match production with consumer demand, whether it is due to variety of consumer preferences or

miscommunication between the focal company and downstream companies. An example would be the risks taken place when expanding into a foreign market with little knowledge of local preferences. Hewlett-Packard (HP) has to develop multiple versions for each model of their DeskJet printers. Each version serves a particular geographical region (Asia-Pacific, Europe, or Americas). Due to uncertain demand in each region, HP faced the problem of overstocking certain printers in one region and under-stocking certain printers in other regions (Kopczak and Lee 1993).

Risks sourced outside of these three categories include risks in the supply chain that neither be called as upstream nor downstream risks that originate outside the supply chain. These risks have been categorised as environmental risks and enterprise risks. The difficulty in categorising these risks arises from the need to define the network boundaries of the supply chain. Another difficulty is the changing nature of risk as it moves through a supply chain. For example, an environmental risk such as fire or earthquake may turn into an operational risk for the company, which in turn creates supply risks and demand risks. Table 4 illustrates a variety of these risks that are different from the operational, supply, and demand risks.

TABLE 4. EXAMPLES OF ENVIRONMENTAL OR NON-OPERATIONAL/SUPPLY/DEMAND RISKS

Reference	**Environmental or non-operational /supply/ demand risks**
Bogotaj and Bogotaj (2007)	risks derived from physical, social, political, legal, operational, economic, or cognitive environment
Christopher and Peck(2004)	risks derived from socio-political, economic, or technological events
Juttner (2005)	risks derived from political, natural, or social uncertainties
Sodhi and Tang (2012)	financial risks, supply chain visibility risks, political/social risks, IT system risks, intellectual property risks, exchange rate risks, environmental risks, regulatory risks
Manuj and Mentzer (2008a)	Security risks, macroeconomic risks, policy risks, competitive risks, and resource-constraint risks

Source: Park et al. (2013)

Environmental risks are basically defined as risks originated from outside the supply chain. Examples of environmental risks vary from tsunamis to labour strikes, to the nationalisation of business assets or the invention and advancement of technology.

Enterprise risks are differentiated from environmental risks by their origin from within the supply chain. However, unlike operational, supply, and demand risks, enterprise risks originate from systems and infrastructure that covers some parts or the entire body of the supply chain. Some of the examples of enterprise risk include the failure of central IT systems that manage information flow throughout the supply chain and legal issues resulting from inadequate supplier compliance policies. A simple view of these classifications is shown in Figure 5.

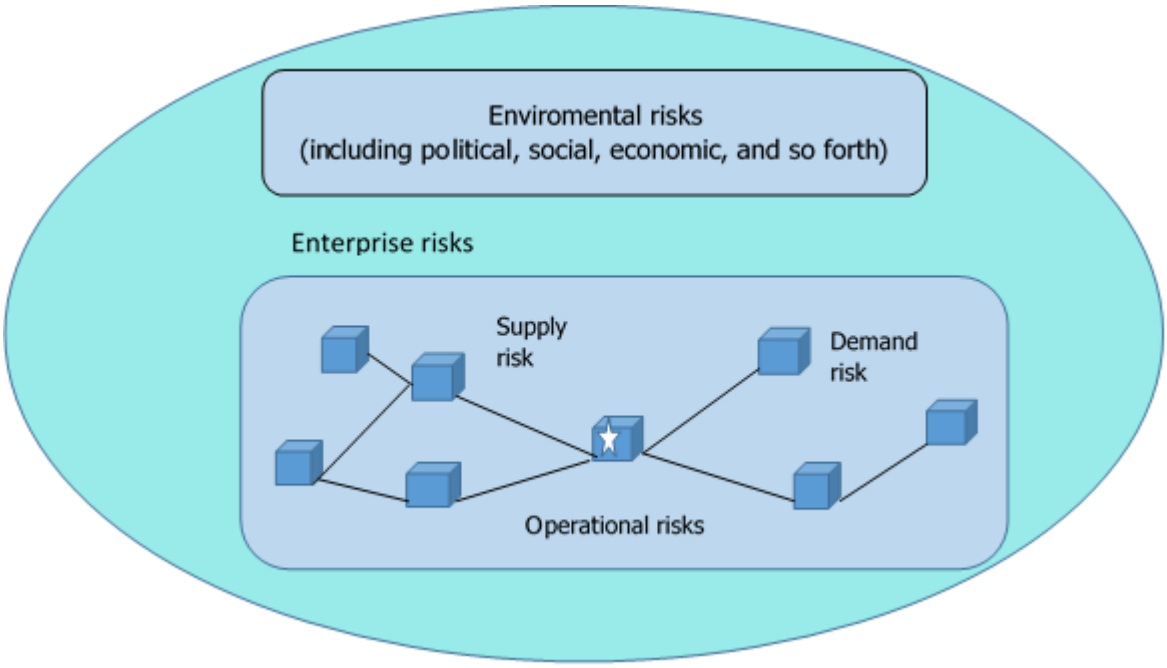

FIGURE 5. AN ADAPTATION OF THE REVIEWED RISK IDENTIFICATION TYPOLOGIES

Source: Park et al. (2013)

Two other categories, aside from this focal firm-centric spatial approach, are a spatial cause-and-effect category of risks and a size of impact-based category of risks. Sodhi and Tang (2012) present a spatial cause-and-effect classification, where risk sources are distinguished as locally-derived or globally-derived and their consequences considered at, again, the local and global levels. This categorization is more easily illustrated in Figure 6.

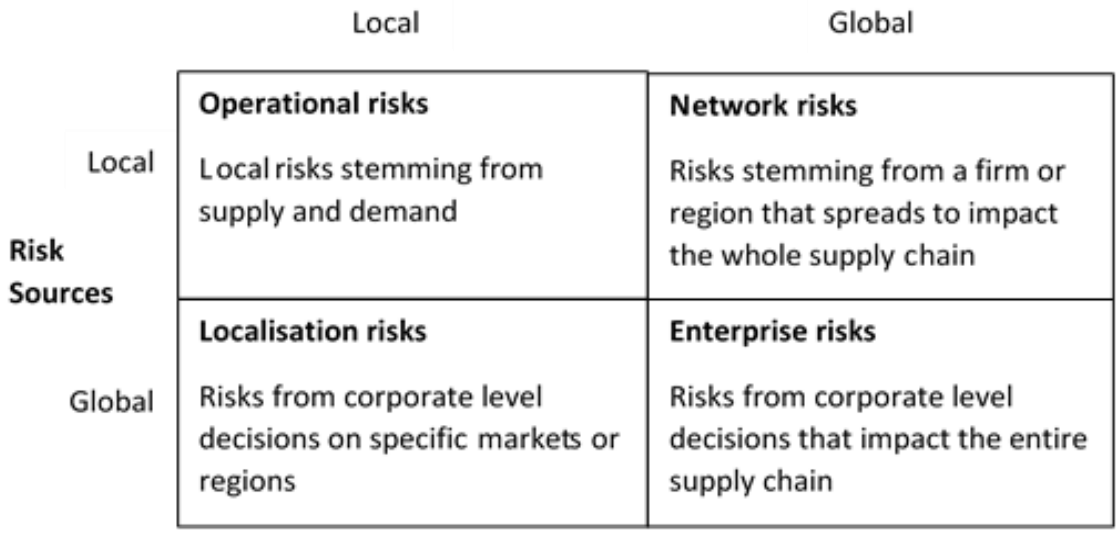

FIGURE 6. ADAPTATION OF A TYPOLOGY OF SUPPLY CHAIN RISK

Source: Sodhi and Tang (2012)

The magnitude of impact-based classification, also introduced by Sodhi and Tang (2012), shows the difference between "normal" risks, classified as "delays", and "abnormal" risks, classified as "disruptions".

2.4. RISK ASSESSMENT

Risk assessment is the next step in the GSCRM. After the identification, the risks will be assessed according to the level of their importance. This process will enable the company to be able to develop strategies to mitigate these risks.

Risk assessment entails determining the severity of risks, measuring the effect of risks through financial, production, logistics or trade performance, the probability of a risk becoming a reality and the potential extent of the loss.

At the beginning, two questions will shape the way how the risks are assessed:

- What is the likelihood of a risk event occurring, and
- What is the significance or impact of that risk event? (Khan and Burners 2007; Zsidisin et al. 2004).

Answering these two questions is difficult in practice due to three challenges.

First is a design problem. In the literature reviewed, there was no global risk assessment tool being developed. Instead, plenty of approaches and associated tools have been introduced. Risk assessment depends on particular situation. Therefore the same risk will have very different reactions depending on time and place in the supply chain. To design a risk assessment process is still an important issue as Manuj and Mentzer (2008) point out, "the heart of risk assessment is asking the right questions."

Second is a coordination issue. The collection of information and the assessment of that information horizontally throughout company and vertically within the levels of company hierarchy are required in the assessment of risks. Since transparency and information may take different forms across these organisational boundaries, risk assessment requires an important coordination approach to implement.

Third is a subjectivity issue. The risks take different form from the point of view of the person who assess. This is the fact that the assessment of risk is significantly affected by the culture, confidence, and knowledge held by the assessor. The perception of risk directly affects the behavioural response to risk (Juttner 2005; Juttner et al. 2003).

On the other hand there are no exact solutions to the above-mentioned problems. What should be done lies on the review of the assessment tool classifications that are introduced in the literature in order for the company to take necessary measures to implement.

There are seven classic risk management tools identified in the literature:

- Question positioning approach ("What if?")
- Internal and external processes mapping (Value Stream Mapping)
- Scores method (a measure of intensity by aggregation)
- Pareto diagram, ABC Ranking

- FMECA (Failure Mode, Effects, and Criticality Analysis)
- Ishikawa Diagram, Brainstorming
- Deming cycle, 6 sigma, permanent improvement

FMECA is a process to assess and classify risks by severity, and to determine their effects, with the intention of tackling the most important ones. Risk management tools are regularly used to identify, understand and solve supply chain risks Lavastre et al. (2012).

2.5. RISK AVOIDANCE AND MITIGATION

Risk avoidance and mitigation are the next step for the enterprises to follow right after the assessment of the risks.

In this step, there are two components:

a. The selection of different risk management strategies

b. The applications of various risk management strategies.

Several reviews have been carried out on the risk avoidance and mitigation strategies available to companies, including the works of Juttner et al. (2003), Manuj and Mentzer (2008a, 2008b), Sodhi and Tang (2012). A meticulous approach should be taken to combine risk mitigation strategies from these studies to come up with solutions as appropriate as possible.

The research findings of the authors in the field of supply chain risk management are analyzed and presented here as the classification, selection and implementation of risk management strategies respectively.

There is a variety of risk management strategies both written and developed in the literature. These risk strategies can be organised along two lines of classification. The first categorises strategies according to whether they involve risk avoidance, mitigation, or acceptance.

Probability of occurrence and impact as the two key characteristics of risk assessment, avoidance focuses on a decrease of probability, while mitigation focuses on impact.

An example of avoidance would be withdrawing from a risky market or adopting a zero tolerance policy on supplier compliance. Mitigation, or reduction of risk, is often done by maintaining an agile, adaptable, and aligned supply chain (Lee 2004) or an aligned, flexible, and buffered supply chain (Sodhi and Tang 2012). The third category, risk acceptance, is the simplest of the three, and involves no action being taken in preventing or addressing the risk event. An example of a framework for mitigation responses can be seen in the framework presented by Lessard and Miller (2001) in Figure 7.

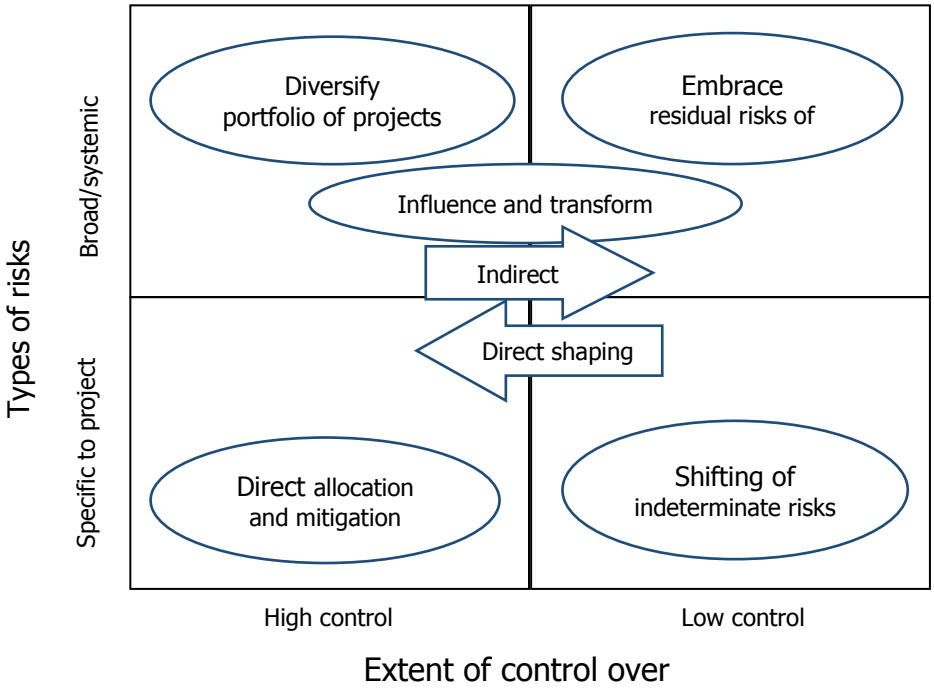

FIGURE 7. A FRAMEWORK OF RISK MITIGATION STRATEGIES

Source: Lessard and Miller (2001)

The second classification of global risk management strategies, shown in Figure 8, is based on the supply chain context; particularly, on whether the strategy caters supply, demand, products, or information. Supply

management covers all upstream-sourced risks, such as bankruptcy of a supplier, distance from the source and supplier failures.

Demand management is held responsible for addressing all downstream risks, such as inventory shortages or just in time delivery to customer. Product management may address any part of the supply chain, but focuses on addressing risk through production process. In the same way, information management may address any part of the supply chain, but aims information management between firms to reduce risk.

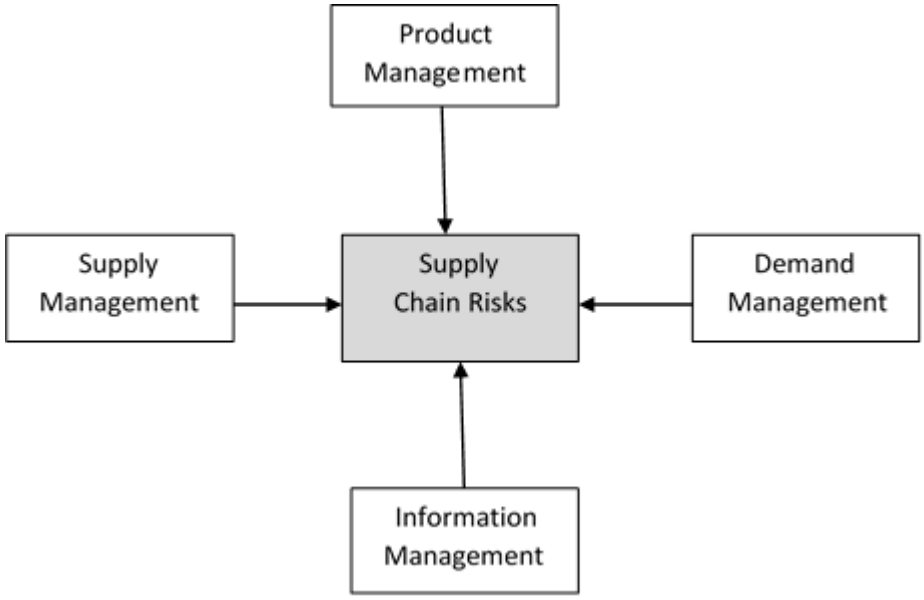

FIGURE 7. A CLASSIFICATION OF RISK MANAGEMENT

Source: Tang (2006)

These two classifications can be integrated in the form of the following statement: "Enterprises can respond to risks through implementation of various risk managements." This has been displayed in Table 5 which demonstrates a variety of strategies found from the literature.

TABLE 5. MATRIX OF GLOBAL SUPPLY CHAIN RISK MANAGEMENT STRATEGIES, CATEGORISED BY RISK RESPONSE AND MANAGEMENT APPROACH

		Risk Response		
		Avoidance	**Mitigation**	**Acceptance**
Risk Management Approach	Supply Management	Divestment, auditing, vertical integration	Contract strategy, multiple/ local sourcing	No strategy
	Demand Management	Divestment, vertical integration	Stockpiling, pricing, marketing	No strategy
	Product Management	Divestment	Postponement	No strategy
	Information Management		Joint business planning, vendor managed inventory	No strategy

Source: Park et al. (2013)

Auditing is a pre-emptive approach to risk avoidance by applying controls and safety measures that prevent the development and happening of risks. An example would be implementing ethical audits of suppliers to prevent the selection of suppliers that are risky and to maintain the soundness of selected suppliers. As has been seen in real life case examples, however, auditing does not totally guarantee the company to avoid risk.

Vertical integration is another approach to avoid risks of supplier or customer misconduct, misunderstanding or mistrust by taking control of them. Continuing with the example of supplier ethics, a company could follow a vertical integration strategy and take control of a key supplier in order to have direct access and control over supplier. The cost of such control, however, is an increased management burden, reduced supply chain flexibility, and the cause of other operational risks to take place.

Divestment is a way of risk avoidance by withdrawing from supplier, customer, or product markets to totally avoid the existence of risks. An example is ending the business with a supplier found guilty of ethical violations in order to protect reputation and cut off possible ethical risks. The drawbacks of a divestment approach are the high opportunity costs and loss of investment incurred by withdrawing from a market.

Contract strategy improves coordination and risk sharing along a supply chain by making agreements between suppliers and companies. These agreements share risks while increasing value across the partners involved. For example, a flexible supplier contract enables a retailer to reduce inventories and better adjust inventory to demand, while the supplier shares in increased profits thanks to such arrangements. Such contracts allow parties to have gains that require multi-party agreement and collaboration. The cost of contract strategies is found in creating, enforcing, and revising them.

Hedging is a supply risk management strategy to mitigate high impact but highly localised risk events through diversification. Multiple sourcing can be implemented as a hedge when such risks affect upstream suppliers, whereas local sourcing is implemented when such risks affect downstream suppliers. An added benefit of hedging is the increase in responsiveness to local demand. The downsides of this strategy are reduced abilities to leverage economies of scale and increased network management burdens. It also requires high levels of investment. Manuj et al. (2008b)

Stockpiling is a stock-based inventory strategy to mitigate unexpected fluctuations in demand. Strategic stockpiling maintains inventory at strategic locations that is accessible to supply chain partners and enable quick response to demand. This concept of building in buffers can be applied not only to inventory, but also to warehouses, distributors, suppliers, and other elements in the supply chain. Two disadvantages to such a strategy, however, are extra costs and decreased transparency in the supply chain.

Pricing is a demand management strategy that affects customer behaviour by means of price manipulation. Also known as income management, this strategy enables supply chain partners to adapt to supply disruptions in goods, such as perishable goods, that are susceptible to demand fluctuations.

Postponement is a product management strategy that increases the ability to respond to changes in demand by redesigning products and/or processes so that resource costs take place as late as possible. The benefits can be considered in the example of a restaurant, where food components are standardised and cooking instructions optimized, in a way that a limited variety of ingredients can be quickly adjusted into a large variety of dishes. The costs due to postponement are the design and restructuring costs associated with new standardised component assemblies and operations.

Joint business planning increases information sharing across supply chain partners to identify areas of strategic alignment and raise the trust and coordination needed to get hold of the potential gains. This can be done through passive infrastructure, such as enterprise resource planning (ERP) systems, and active management, such as monthly or yearly partner meetings. The possible risks include the danger of creating opportunities for partners to turn into market competitors and creating security risks by sharing important information.

Vendor managed inventory allows risk sharing through information sharing, and involves a retailer passing on valuable market data to the supplier in return for the supplier taking responsibility for inventory risk. This is quite attractive to suppliers looking to improve their capabilities and acquire higher value-added activities.

As the above descriptions make clear, every strategy causes costs. Reducing exposure to one risk increases exposure to another. Initial work has been presented by the likes of Manuj and Mentzer (2008a) and Sodhi and Tang (2012) on building decision support tools for companies choosing

suitable risk management strategies, but further research and development is needed. Moreover, it should be made clear that the list of above mentioned risk management strategies is not enough to eradicate the problems. These strategies provide a starting point for considerations made by people in charge of the risk management.

Marketing is another demand management strategy that enables companies to influence demand. This strategy includes concepts of product substitution, product bundling, and assortment planning and visual merchandising. These allow companies to shift customer preferences across products to be able to confront demand uncertainty and propagate supply variability.

Beyond the selection of an appropriate risk management strategy is the actual implementation of that strategy. This field is even less developed than the strategy selection literature, and an empirical study of factors influencing the implementation of strategies and of the success of different strategies is needed.

CHAPTER 3

3. RESEARCH

This chapter includes the aim and scope of the research, data collecting method, sampling, and the development of questionnaire, data analyzing method, and results and findings of the survey.

3.1. THE AIM AND SCOPE OF THE RESEARCH

The aim of the research is to investigate the perceptions of SMEs on global supply chain risks and attitudes towards these risks.

3.2. VARIABLES AND SAMPLING

Due to the fact it is very time consuming and expensive to observe the high number of SMEs, a sampling was decided. The sample of the research is the SMEs from different geographic regions of Turkey.

3.3. DATA COLLECTING METHOD

In this research, the questionnaire method was chosen to collect the data. In order to develop the questionnaire and analyze the results, first of all global supply chain and GSCRM concepts were explained. Afterwards to manage those risks, necessary steps which are namely risks identification, risk assessment and risk mitigation were taken up.

The type of research used to administer the questionnaire to SMEs was quantitative. This questionnaire includes demographic characteristics of SMEs and the questions to learn SMEs relationships with their suppliers and attitudes towards global supply chain risks.

Questionnaires were prepared online and some were prepared as hard copy. They were sent to the e-mails of the companies.

The hard copies of the questionnaires were also distributed by the researcher to the target sample. The participants were the companies that attended a trade fair in Istanbul. They were asked to fill in the distributed questionnaires to be collected.

3.4. THE QUESTIONNAIRE DEVELOPMENT

The questionnaire is composed of five sections. In the first section, 8 questions are asked to comprehend the profile of the SMEs with regards to demographical characteristics.

In the second section, Likert scale is used. 21 possible risks in global supply chain are listed for the SMEs to scale.

The third section includes questions to know whether SMEs have supply chain risk management unit and budget. It also includes questions in the format of Likert scale to understand the relationship between SMEs and their suppliers.

In the fourth section, Likert scale is also used. The aim of the questions here is to get to know how SMEs approach to mitigate the risks.

Lastly in the fifth section, 6 questions are asked to know more about the person who answers the questionnaire.

3.5. DATA ANALYZING METHOD

The Statistical Package for the Social Sciences (SPSS) version 22 was used for statistical analysis. When evaluating study data, statistical methods (Number, percentage, average, standard deviation) were used. The answered questionnaires of 62 participants have been entered in as variables in SPSS for Windows 22.

3.6. RESULTS AND FINDINGS OF THE SURVEY

This section contains the results of the data collected. An analysis of the results of the survey is rendered.

3.6.1. Interpretation of Questions Used in the Questionnaire

In the questionnaire respondents were asked 59 questions to measure their understanding of supply chain risks and supply chain risk management. These questions are interpreted according to the percentages given in the tables.

TABLE 6. CHARACTERISTICS OF COMPANIES

	Frequency	***Percent (%)***	***Cumulative (%)***
Legal Structure Of The Company			
Incorporated(Limited)	32	53.3	53.3
Joint-Stock	23	38.3	91.7
Other	5	8.3	100.0
Type Of Foreign Trade			
Import	10	16.1	16.1
Export	29	46.8	62.9
Both	23	37.1	100.0
Nature of Business			
Food	9	15.0	15.0
Textile	10	16.7	31.7
Furniture	2	3.3	35.0
Service	3	5.0	40.0
Manufacturing Of Machinery Equipment	6	10.0	50.0
Packaging	2	3.3	53.3
Plastics	4	6.7	60.0
Automotive	4	6.7	66.7
Construction	5	8.3	75.0
Heating And Cooling	3	5.0	80.0
Computer Software	1	1.7	81.7
Glassware	1	1.7	83.3
Jewelry	1	1.7	85.0
Agriculture-Livestock	3	5.0	90.0
Energy	3	5.0	95.0
Chemistry	3	5.0	100.0
Region Of Foreign Trade			
Europe	35	27.1	27.1
Middle east	31	24.0	51.1
Fareast Asia	17	13.2	64.3
Africa	26	20.2	84.5
Russia and Central Asia	20	15.5	100
Foundation Year			
1-10 years	20	32.3	32.3
11-20 years	18	29.0	61.3
21-30 years	8	12.9	74.2
more than 30 years	16	25.8	100.0

CHARACTERISTICS OF COMPANIES

	Frequency	***Percent (%)***	***Cumulative (%)***
Number of Employee			
1-50	32	51.6	51.6
51-100	13	21.0	72.6
101-250	15	24.2	96.8
more than 250	2	3.2	100.0
Number of Foreign Language Speaking Employee			
1-5	34	54.8	54.8
6-10	9	14.5	69.4
11-20	10	16.1	85.5
more than 20	3	4.8	90.3
none	6	9.7	100.0
Person/Unit In Charge of SCM			
general manager	24	40.0	40.0
department of production	3	5.0	45.0
department of export/import	7	11.7	56.7
purchasing department	21	35.0	91.7
independent supply chain management	2	3.3	95.0
department of logistics	3	5.0	100.0
Means Of Communicatıon With Suppliers			
regular meetings	12	9.7	9.7
regular visits	23	18.5	28.2
irregular visits	24	19.4	47.6
irregular meetings	22	17.7	65.3
telecommunication	43	34.7	100
Location of company			
Ankara	3	4.8	4.8
Aydın	1	1.6	6.5
Bursa	2	3.2	9.7
Denizli	1	1.6	11.3
Eskişehir	1	1.6	12.9
Istanbul	44	71	83.9
İzmir	1	1.6	85.5
Kahramanmaraş	1	1.6	87.1
Kayseri	2	3.2	90.3
Kocaeli	2	3.2	93.5
Konya	1	1.6	95.2
Manisa	1	1.6	96.8
Şanlıurfa	1	1.6	98.4
Van	1	1.6	100.0

Table 6 summarizes the characteristics of the companies which participated the survey. According to the results in Table 6, 32 companies (53.3%) are incorporated (limited) , 23 companies (38.3%) are joint-stock.

10 companies (16.1%) import, 29 companies (46.8%) export and 23 companies (37.1%) both import and export.

With regards to the nature of business; 9 companies (15%) are in food sector, 10 companies (16.7%) are in textile sector, 2 companies (3.3%) are in furniture sector, 3 companies (5%) are in service sector, 6 companies (10%) are in the sector of manufacturing machinery equipment, 2 companies (3.3%) are in packaging sector, 4 companies (6.7%) are in plastics sector, 4 companies (6.7%) are in automotive sector, 5 companies (8.3) are in construction sector, 3 companies (5%) are in heating and cooling sector, 1 company (1.7%) is in computer software sector, 1 company (1.7%) is in glassware sector, 1 company (1.7%) is in jewelry sector, 3 companies (5%) are in agriculture and livestock sector, 3 companies (5%) are in energy sector and 3 companies (5%) are in chemistry sector.

As for the region of foreign trade; 35 companies (27.1%) is Europe, 31 companies (24%) is Middle east, 17 companies (13.2%) is Fareast Asia, 26 companies (20.2%) is Africa, 20 companies (15.5%) is Russia and Central Asia. According to the figures for the region of trade, Europe and Middle East share the majority of the business made by SMEs. This is possibly due to the proximity to these regions. It is interesting to see Middle East region as a major market because it is the region of conflicts. Far East is the region of market with the least share. This is probably the costs due to long distances, preferences of people in that region, etc.

With regards to foundation year; 20 companies (32.3%) have been in business between 1-10 years, 18 companies (29%) have been business in between 11-20 years, 8 companies (12.9%) have been in business between 21-30 years, and 16 companies (25.8%) have been in business for more than 30 years.

According to the results for the number of employees; 32 companies (51.6%) have 1-50 employees, 13 companies (21.0%) have 51-250

employees, 15 companies (24.2%) have 101-250 employees, and 2 companies (3.2%) have more than 250 employees.

When it comes to the number of employees who can speak foreign language; 34 companies (54.8%) employ 1-5 people who can speak foreign language, 9 companies (14.5%) employ 6-10 people who can speak foreign language, 10 companies (16.1%) employ 11-20 people who can speak foreign language, 3 companies (4.8%) employ more than 20 people who can speak foreign language, and 6 companies (9.7%) don't have any employee who can speak foreign language. The figures indicate that almost all companies give importance to foreign language.

As for the person/unit in charge of SCM; in 24 companies (40.0%), general manager is responsible for SCM, In 3 companies (5.0%), department of production is responsible for SCM, In 7 companies (11.7%), department of export/import is responsible for SCM, In 21 companies (35.0%), purchasing department is responsible for SCM, In 2 companies (3.3%), independent supply chain management unit is responsible for SCM, In 3 companies (5.0%), department of logistics is responsible for SCM. According to these results, most of the companies assign their manager for SCM instead of establishing a separate SCM. This may be due to additional cost to the company.

According to the results in Table 6, 12 companies (9.7%) organize regular meetings with the suppliers, 23 companies (18.5%) organize regular visits to the suppliers, 24 companies (19.4) make irregular visits to the suppliers, 22 companies (17.7%) have irregular meetings with the suppliers, and 43 companies (34.7%) use internet as a means of communication with the suppliers. The results indicate that companies prefer to communicate by means of internet, telephone etc. This is probably due to problem of time allocation and travel costs.

According to the answers for the last question in Table 6; companies (4.8%) are in Ankara, 1 company (1.6%) is in Aydın, 2 companies (3.2) are

in Bursa, 1 company (1.6%) is in Denizli, 1 company (1.6%) is in Eskişehir, 40 companies (71%) are in Istanbul, 1 company (1.6%) is in İzmir, 1 company (1.6%) is in Kahramanmaraş, 2 companies (3.2%) are in Kayseri, 2 companies (3.2%) are in Kocaeli, 1 company (1.6%) is in Konya, 1 company (1.6%) is in Manisa, 1 company (1.6%) is in Şanlıurfa, and 1 company (1.6%) is in Van. According to these results, companies from almost all geographic regions of Turkey participated to the survey. It can be said that the results reflect somewhat the situation of all SMEs in Turkey.

The distributions of samples according to the questions which are used to determine the companies' understandings of the risks that they face in their business are shown in Table 7 below.

TABLE 7. UNDERSTANDING OF THE RISKS FACED BY THE COMPANIES

		Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)	Weighted Average (1-5)	Standard Deviation
		1	**2**	**3**	**4**	**5**		
1	Delays due to laws and regulations of supplier's country	14.8	23.0	26.2	24.6	11.5	**2.95**	1.244
2	Costs due to laws and regulations of supplier's country	6.6	23	27.9	32.8	9.8	**3.17**	1.098
3	Political instability of the supplier's country	8.3	18.3	23.3	26.7	23.3	**3.38**	1.263
4	Natural disasters occurred in the supplier's country	11.5	21.3	23	26.2	18	**3.18**	1.285
5	Proximity to the region of conflict(ex; situation in the middle east)	11.5	9.8	23	37.7	18	**3.41**	1.230
6	Financial difficulties or bankruptcy of supplier	10	18.3	15	35	21.7	**3.40**	1.291
7	Rising labor costs	4.9	13.1	31.1	31.1	19.7	**3.47**	1.105
8	Raw material price fluctuations	8.2	8.2	16.4	27.9	39.3	**3.82**	1.272
9	Change in technology(ex; failure to update the technology used in the company)	9.7	19.4	30.6	32.3	8.1	**3.10**	1.112
10	Unplanned IT disruptions (computer and its operating system's issues)	11.7	41.7	21.7	18.3	6.7	**2.67**	1.115
11	Counterfeiting and patent issues	9.8	13.1	31.1	26.2	19.7	**3.33**	1.221
12	Telecommunications outages	9.8	19.7	29.5	31.1	9.8	**3.11**	1.142
13	Cyber attacks	27.9	21.3	23	19.7	8.2	**2.59**	1.309
14	Energy/fuel prices volatility	8.2	16.4	27.9	26.2	21.3	**3.36**	1.225
15	Raw material supply disruptions	3.3	11.5	23	39.3	23	**3.68**	1.06
16	Currency fluctuations	3.3	1.7	15	51.7	28.3	**4.00**	0.902
17	Inability of the supplier to meet standards and quality	8.3	6.7	16.7	35	33.3	**3.78**	1.223
18	Delays due to personnel of the supplier	8.2	16.4	34.4	27.9	13.1	**3.21**	1.127
19	Costs due to the personnel of the supplier	9.8	13.1	34.4	31.1	11.5	**3.21**	1.127
20	Disruptions due to logistics with regards to delivery of product	10	12	24	34	20	**3.42**	1.230
21	Inability of the supplier to adapt changes on demand fluctuation and the variety of the product	10	22	20	30	18	**3.24**	1.271

The distribution of sample according to the question "To what extend do you agree that delays due to laws and regulations of supplier's country are posing risk to your business?" is as follows: 9 companies (14.8%) strongly disagree, 14 companies (23.0%) disagree, 16 companies (26.2%) neither agree nor disagree, 15 companies (24.6%) agree and 7 companies (11.5%) strongly agree. According to the results delays due to laws and regulations of supplier's country are not perceived as serious risk by the companies in general.

The distribution of sample according to the question "To what extend do you agree that costs due to laws and regulations of supplier's country are posing risk to your business? is as follows: 4 companies (6.6%) strongly disagree, 14 companies (23.0%) disagree, 17 companies (27.9%) neither agree nor disagree, 20 companies (32.8%) agree and 6 companies (9.8%) strongly agree. Companies do not see "costs due to laws and regulations of supplier's country" as a threatening risk for their business.

The distribution of sample according to the question "To what extend do you agree that political instability of the supplier's country is posing risk to your business?" is as follows: 5 companies (8.3%) strongly disagree, 11 companies (18.3%) disagree, 14 companies (23.3%) neither agree nor disagree, 16 companies (26.7%) agree and 14 companies (23.3%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that natural disasters occurred in the supplier's country posing risk to your business?" is as follows: 7 companies (11.5%) strongly disagree, 13 companies (21.3%) disagree, 14 companies (23.0%) neither agree nor disagree, 16 companies (26.2%) agree and 11 companies (18%) strongly agree

The distribution of sample according to the question "To what extend do you agree that proximity to the region of conflict (ex; situation in the Middle East) is posing risk to your business?" is as follows: 7 companies (11.5%)

strongly disagree, 6 companies (9.8%) disagree, 14 companies (23.0%) neither agree nor disagree, 23 companies (37.7%) agree and 11 companies (18%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that financial difficulties or bankruptcy of supplier posing risk to your business?" is as follows: 6 companies (10%) strongly disagree, 11 companies (18.3%) disagree, 9 companies (15%) neither agree nor disagree, 21 companies (35%) agree and 13 companies (21.7%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that rising labor costs is posing risk to your business?" is as follows: 3 companies (4.9%) strongly disagree, 8 companies (13.1%) disagree, 19 companies (31.1%) neither agree nor disagree, 19 companies (31.1%) agree and 12 companies (19.7%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that raw material price fluctuations are posing risk to your business?" is as follows: 5 companies (8.2%) strongly disagree, 5 companies (8.2%) disagree, 10 companies (16.4%) neither agree nor disagree, 17 companies (27.9%) agree and 24 companies (39.3%) strongly agree. The result indicates that the companies think that fluctuations in the price of raw material may affect their business.

The distribution of sample according to the question "To what extend do you agree that change in technology (ex; failure to update the technology used in the company) is posing risk to your business?" is as follows: 6 companies (9.7%) strongly disagree, 12 companies (19.4%) disagree, 19 companies (30.6%) neither agree nor disagree, 20 companies (32.3%) agree and 5 companies (8.1%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that unplanned IT disruptions are posing risk to your business?" is

as follows: 7 companies (11.7%) strongly disagree, 25 companies (41.7%) disagree, 13 companies (21.7%) neither agree nor disagree, 11 companies (18.3%) agree and 4 companies (6.7%) strongly agree. The distribution shows that unplanned IT disruptions are not posing risk to the businesses of the companies.

The distribution of sample according to the question "To what extend do you agree that counterfeiting and patent issues are posing risk to your business?" is as follows: 6 companies (9.8%) strongly disagree, 8 companies (13.1%) disagree, 19 companies (31.1%) neither agree nor disagree, 16 companies (26.2%) agree and 12 companies (19.7%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that telecommunications outages are posing risk to your business?" is as follows: 6 companies (9.8%) strongly disagree, 12 companies (19.7%) disagree, 18 companies (29.5%) neither agree nor disagree, 19 companies (31.1%) agree and 6 companies (19.7%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that cyber-attacks are posing risk to your business?" is as follows: 17 companies (27.9%) strongly disagree, 13 companies (21.3%) disagree, 14 companies (23%) neither agree nor disagree, 12 companies (19.7%) agree and 5 companies (8.2%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that energy/fuel prices volatility is posing risk to your business?" is as follows: 5 companies (8.2%) strongly disagree, 10 companies (16.4%) disagree, 17 companies (27.9%) neither agree nor disagree, 16 companies (26.2%) agree and 13 companies (21.3%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that raw material supply disruptions are posing risk to your business?" is as follows: 2 companies (3.3%) strongly disagree, 7 companies

(11.5%) disagree, 14 companies (23%) neither agree nor disagree, 24 companies (39.3%) agree and 14 companies (23%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that currency fluctuations are posing risk to your business?" is as follows: 2 companies (3.3%) strongly disagree, 1 company (1.7%) disagrees, 9 companies (15%) neither agree nor disagree, 31 companies (51.7%) agree and 17 companies (28.3%) strongly agree. The results indicate that currency fluctuations are clearly perceived as serious risk for the companies.

The distribution of sample according to the question "To what extend do you agree that inability of the supplier to meet standards and quality is posing risk to your business?" is as follows: 5 companies (8.3%) strongly disagree, 4 companies (6.7%) disagree, 10 companies (16.7%) neither agree nor disagree, 21 companies (35%) agree and 20 companies (33.3%) strongly agree. The SMEs also regard "inability of the supplier to meet standards and quality" as a risk.

The distribution of sample according to the question "To what extend do you agree that delays due to personnel of the supplier are posing risk to your business?" is as follows: 5 companies (8.2%) strongly disagree, 10 companies (16.4%) disagree, 21 companies (34.4%) neither agree nor disagree, 17 companies (27.9%) agree and 8 companies (13.1%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that costs due to the personnel of the supplier are posing risk to your business?" is as follows: 6 companies (9.8%) strongly disagree, 8 companies (13.1%) disagree, 21 companies (34.4%) neither agree nor disagree, 19 companies (31.1%) agree and 7 companies (11.5%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that costs due to the personnel of the supplier are posing risk to

your business?" is as follows: 5 companies (10%) strongly disagree, 6 companies (12%) disagree, 12 companies (24%) neither agree nor disagree, 17 companies (34%) agree and 10 companies (20%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that inability of the supplier to adapt changes on demand fluctuation and the variety of the product is posing risk to your business?" is as follows: 5 companies (10%) strongly disagree, 11 companies (22%) disagree, 10 companies (20%) neither agree nor disagree, 15 companies (30%) agree and 9 companies (18%) strongly agree.

TABLE 8. DEGREE OF RELATIONSHIP BETWEEN COMPANIES AND THEIR SUPPLIERS

		Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)	Weighted Average(1-5)	Standard Deviation
		1	**2**	**3**	**4**	**5**		
1	My company is concerned about supply chain risks	9.8	8.2	36.1	26.2	19.7	**3.38**	1.186
2	Our suppliers take part in our supply chain risk management activities	8.2	27.9	27.9	26.2	9.8	**3.02**	1.133
3	Formal document exists to describe the methods of work between my company and the suppliers	0	11.5	27.9	31.1	29.5	**3.79**	1.002
4	Ending the relationship with our supplier would have series consequences for our business	6.6	32.8	23	29.5	8.2	**3.00**	1.111
5	If this relationship was stopped it would be easy for my company to replace the supplier	0	8.2	24.6	44.3	23	**3.82**	0.885
6	The majority of the decisions concerning the supply chain risk management are taken by our supplier	15	40	25	15	5	**2.55**	1.08
7	The majority of the decisions concerning the supply chain risk management are taken by my company	3.3	15	26.7	38.3	16.7	**3.50**	1.05
8	The majority of the decisions concerning the supply chain risk management are taken by both my company and the supplier	1.7	18.3	36.7	33.3	10	**3.32**	0.948
9	My company trust its suppliers	1.7	3.4	28.8	57.6	8.5	**3.68**	0.753
10	Supply chain disruptions have negative impacts on my company's and financial performance	1.6	4.9	34.4	36.1	23	**3.74**	0.929
11	Supply chain disruptions have negative impacts on my company's overall performance	1.6	11.5	24.6	37.7	24.6	**3.72**	1.019

The distributions of the samples according to the statements which determine the degree of relationship between the companies and their suppliers are demonstrated in Table 8 above.

The distribution of sample according to the question "Is your company involved in any plan about supply chain risk management" is as follows: 35 companies (57.4%) say "yes", 26 companies (42.6%) say "no".

The distribution of sample according to the question "Is a budget allocated for supply chain risk management" is as follows: 32 companies (52.5%) say "yes", 29 companies (47.5%) say "no". According to the results, more than half of the companies think that it is necessary to allocate budget for supply chain risk management.

The distribution of sample according to the question "If the budget is allocated, what is the amount in percentage of turnover?" is as follows: 11 companies (29.7%) have allocated budget less than 2% of their turnover, 11 companies (29.7%) have allocated budget between 3-5% of their turnover, 9 companies (24.3%) have allocated budget between 6-10% of their turnover, and 3 companies (8.1%) have allocated budget more than 15% of their turnover.

The distribution of sample according to the question "To what extend do you agree that your company is concerned about supply chain risks" is as follows: 6 companies (9.8%) strongly disagree, 5 companies (8.2%) disagree, 22 companies (36.1%) neither agree nor disagree, 16 companies (26.2%) agree and 12 companies (19.7%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that your suppliers take part in your supply chain risk management activities" is as follows: 5 companies (8.2%) strongly disagree, 17 companies (27.9%) disagree, 17 companies (27.9%) neither agree nor disagree, 16 companies (26.2%) agree and 6 companies (9.8%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that formal document must exist to describe the methods of work between your company and the suppliers" is as follows: 7 companies (11.5%) disagree, 17 companies (27.9%) neither agree nor disagree, 19 companies (31.1%) agree and 18 companies (29.5%) strongly agree. Most of the companies believe that formal document must exist between your company and the suppliers.

The distribution of sample according to the question "To what extend do you agree that stopping the relationship with your supplier would have series consequences for your business" is as follows: 4 companies (6.6%) strongly disagree, 20 companies (32.8%) disagree, 14 companies (23%) neither agree nor disagree, 18 companies (29.5%) agree, and 5 companies (8.2%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that if this relationship was stopped it would be easy for your company to replace the supplier" is as follows: 5 companies (8.2%) disagree, 15 companies (24.6%) neither agree nor disagree, 27 companies (44.3%) agree, and 14 companies (23%) strongly agree. According to these results, it is not difficult for the companies to find new suppliers in case they want to replace the existing ones.

The distribution of sample according to the question "To what extend do you agree that the majority of the decisions concerning the supply chain risk management are taken by your supplier" is as follows: 9 companies (15%) strongly disagree, 24 companies (40%) disagree, 15 companies (25%) neither agree nor disagree, 9 companies (15%) agree, and 3 companies (5%) strongly agree. The results show that companies do not leave the management of supply chain to their suppliers.

The distribution of sample according to the question "To what extend do you agree that the majority of the decisions concerning the supply chain risk management are taken by your company" is as follows: 2 companies (3.3 %)

strongly disagree, 9 companies (15%) disagree, 16 companies (26.7%) neither agree nor disagree, 23 companies (38.3%) agree, and 10 companies (16.7%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that the majority of the decisions concerning the supply chain risk management are taken by both your company and the supplier?" is as follows: 1 company (1.7%) strongly disagrees, 11 companies (18.3%) disagree, 22 companies (36.7%) neither agree nor disagree, 20 companies (33.3%) agree, and 6 companies (10%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that your company trust its suppliers" is as follows: 1 company (1.7%) strongly disagrees, 2 companies (3.4%) disagree, 17 companies (28.8%) neither agree nor disagree, 34 companies (57.6%) agree, and 5 companies (8.5%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that supply chain disruptions have negative impacts on my company's financial performance" is as follows: 1 company (1.6%) strongly disagrees, 3 companies (4.9%) disagree, 21 companies (34.4%) neither agree nor disagree, 22 companies (36.1%) agree, and 14 companies (23%) strongly agree. Most of the companies believe that supply chain disruptions have negative impacts on their financial performance.

The distribution of sample according to the question "To what extend do you agree that supply chain disruptions have negative impacts on my company's overall performance" is as follows: 1 company (1.6%) strongly disagrees, 7 companies (11.5%) disagree, 15 companies (24.6%) neither agree nor disagree, 23 companies (37.7%) agree, and 15 companies (24.6%) strongly agree. Majority of the companies think that supply chain disruptions have negative impacts on the company's overall performance.

The distributions of the samples according to statements which reveal the behaviours of the companies towards different risk mitigating strategies are shown in Table 9 below.

TABLE 9. RATING OF RISK MITIGATING STRATEGIES BY COMPANIES

		Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)	Weighted Average(1-5)	Standard Deviation
		1	**2**	**3**	**4**	**5**		
1	Implement dual sourcing strategy	0	4.9	27.9	47.5	19.7	**3.82**	0.806
2	Pursue supplier collaboration	1.6	8.2	21.3	49.2	19.7	**3.77**	0.92
3	Use both regional and global strategy	1.6	4.9	29.5	45.9	18	**3.74**	0.874
4	Follow make to order policy	1.6	3.3	26.2	36.1	32.8	**3.95**	0.939
5	Increase inventory levels and safety stock	6.6	14.8	34.4	37.7	6.6	**3.23**	1.007
6	Use component substitution strategy	10	20	25	40	5	**3.10**	1.1
7	Lower the price of the product	4.9	21.3	49.2	14.8	9.8	**3.03**	0.983
8	Establish distribution centers in multiple regions	13.1	19.7	42.6	16.4	8.2	**2.87**	1.103
9	Give importance to geographical proximity to suppliers	15	15	40	20	10	**2.95**	1.171
10	Focus on advertisement and marketing.	18	1.6	21.3	37.7	21.3	**3.42**	1.347

The distribution of sample according to the question "To what extend do you agree that you implement dual sourcing strategy to mitigate risks" is as follows: 3 companies (4.9%) disagree, 17 companies (27.9%) neither agree nor disagree, 29 companies (47.5%) agree, and 12 companies (19.7%) strongly agree. With regards to the results, dual sourcing strategy is seen as an important strategy to be implemented.

The distribution of sample according to the question "To what extend do you agree that you pursue supplier collaboration" is as follows: 1 company (1.6%) strongly disagrees, 5 companies (8.2%) disagree, 13 companies (21.3%) neither agree nor disagree, 30 companies (49.2%) agree, and 12 companies (19.7%) strongly agree. This strategy is one of the most important strategies to be followed by the SMEs among others.

The distribution of sample according to the question "To what extend do you agree that you use both regional and global strategy to mitigate risks" is as follows: 1 company (1.6%) strongly disagrees, 3 companies (4.9%) disagree, 18 companies (29.5%) neither agree nor disagree, 28 companies (45.9%) agree, and 11 companies (18%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that you follow make to order policy to mitigate risks" is as follows: 1 company (1.6%) strongly disagrees, 2 companies (3.3%) disagree, 16 companies (26.2%) neither agree nor disagree, 22 companies (36.1%) agree, and 20 companies (32.8%) strongly agree. According to the results, most of the companies in the survey believe that make to order policy is very important strategy to be implemented.

The distribution of sample according to the question "To what extend do you agree that you increase inventory levels and safety stock to mitigate risks" is as follows: 4 companies (6.6%) strongly disagree, 9 companies (14.8%) disagree, 21 companies (34.4%) neither agree nor disagree, 23 companies (37.7%) agree, and 4 companies (6.6%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that you use component substitution strategy to mitigate risks" is as follows: 6 companies (10%) strongly disagree, 12 companies (20%) disagree, 15 companies (25%) neither agree nor disagree, 24 companies (40%) agree, and 3 companies (5%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that you lower the price of the product to mitigate risks" is as follows: 3 companies (4.9%) strongly disagree, 13 companies (21.3%) disagree, 30 companies (49.2%) neither agree nor disagree, 9 companies (14.8%) agree, and 6 companies (9.8%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that you establish distribution centers in multiple regions to mitigate risks" is as follows: 8 companies (13.1%) strongly disagree, 12 companies (19.7%) disagree, 26 companies (42.6%) neither agree nor disagree, 10 companies (16.4%) agree, and 5 companies (8.2%) strongly agree. This strategy is not regarded as a strategy to be implemented by the majority of the companies.

The distribution of sample according to the question "To what extend do you agree that you give importance to geographical proximity to suppliers" is as follows: 9 companies (15%) strongly disagree, 9 companies (15%) disagree, 24 companies (40%) neither agree nor disagree, 12 companies (20%) agree, and 6 companies (10%) strongly agree.

The distribution of sample according to the question "To what extend do you agree that you focus on advertisement and marketing to mitigate risks" is as follows: 11 companies (18%) strongly disagree, 1 company (1.6%) disagrees, 13 companies (21.3%) neither agree nor disagree, 23 companies (37.7%) agree, and 13 companies (21.3%) strongly agree.

TABLE 10. CHARACTERISTICS OF RESPONDENTS

	Frequency	***Percent (%)***	***Cumulative (%)***
Age			
20–30	16	28.6	28.6
31–40	28	50	78.6
41–50	9	16	94.6
Over 50	3	5.4	100
Gender			
Male	61	98.4	98.4
Female	1	1.6	100
Education Level			
High school	6	6	10.0
Vocational school	4	4	16.7
Undergraduate	34	34	73.3
Graduate	16	16	100.0
Position In The Company			
Owner	14	24.1	24.1
Member of board	10	17.2	41.4
General manager	7	12.1	53.4
Export manager	17	29.3	82.8
Import manager	2	3.4	86.2
Other	8	13.8	100.0

Table 10 summarizes the characteristics of the respondents who answered the questionnaire. According to the results in Table 10, 16 participants (28.6%) are 20-30, 28 participants (50%) are 31-40, 9 participants (16%) are 41-50, and 3 participants (5.4%) are 50 and over. 60 participants (96.8%) are males, 1 participant (1.6) is female. 6 participants (10%) are high school graduates, 4 participant (6.7%) are graduates of vocational school, 34 participants (56.7%) are undergraduates, and 16 participants (26.7%) are graduates. 14 participants (24.1%) are owners, 10 participants (17.2) are members of board, 7 participants (12.1%) are general managers, 17 participants (29.3%) are export managers, 2 participants (3.4%) are import managers. As for the others; 4 participants (6.8%) are marketing managers, 1 participant (1.6%) is production engineer, 2 participants (3.4%) are purchasing managers, and 1 participant (1.7%) is quality controller.

3.6.2. Cross-Tabulation Analysis of Significant Tables

Cross-tabulation analysis entails analyzing the percentages in the tables. The table allows researcher to assess the evidence for the original hypothesis or the idea about the relationship between the independent and dependent variables (Matthew David and Carole D. Sutton 2004).

In this research, cross-tabulation analysis has been made by SPSS v.22. The results with significant values are given in Chi Square Test Analysis below.

3.6.3. Chi Square Test Analysis

Chi-square test is a nonparametric statistical analyzing method often used in experimental work where the data consist in frequencies. The most common use of the test is to assess the probability of association or independence of facts (Maxwell A.E. 1971).

The relationship between variables is investigated by means of chi-square value and the significance (p), if the significance (p value) is smaller than 0.05, it is inferred that there is a relationship between variables otherwise not

TABLE 11. RELATIONSHIP BETWEEN TYPE OF FOREIGN TRADE AND QUESTIONS

	Type of foreign trade	
	Chi-Square	p value
Currency fluctuations	18.801	**0.016**
Costs due to the personnel of the supplier	15.949	**0.043**
Inability of the supplier to adapt changes on demand fluctuation and the variety of the product	18.043	**0.021**
Supply chain disruptions have negative impacts on my company's overall performance	16.311	**0.038**
Lower the price of the product	16.700	**0.033**

According to the results;

1. There is a relationship between the answers of "What is the type of your foreign trade?" and "currency fluctuations".

2. There is a relationship between the answers of "What is the type of your foreign trade?" and "costs due to the personnel of the supplier".

3. There is a relationship between the answers of "What is the type of your foreign trade?" and "inability of the supplier to adapt changes on demand fluctuation and the variety of the product".

4. There is a relationship between the answers of "What is the type of your foreign trade?" and "Supply chain disruptions have negative impacts on my company's overall performance".

5. There is a relationship between the answers of "What is the type of your foreign trade?" and "Lower the price of the product".

There is no relationship between type of foreign trade and other questions due to the fact that their p value is > 0.05.

TABLE 12. RELATIONSHIP BETWEEN NATURE OF BUSINESS AND SELECTED QUESTIONS

	Nature of business	
	Chi-Square	p value
Pursue supplier collaboration	99.195	0.001
Establish distribution centers in multiple regions	81.494	0.034

According to the results; there is a relationship between natures of business and "pursuing supplier collaboration" since p value is < 0.05.

There is also a relationship between nature of business and "establish distribution centers in multiple regions" because p value is 0.034.

There is no relationship between nature of business and other questions due to the fact that their p value is > 0.05.

TABLE 13. RELATIONSHIP BETWEEN AGE AND SELECTED QUESTIONS

	Age	
	Chi-Square	p value
Proximity to the region of conflict (ex; situation in the middle east)	136.600	0.009
Increase inventory levels and safety stock	131.978	0.018

According to the results; there is a relationship between "age" and "proximity to the region of conflict" since p value is < 0.05.

There is also a relationship between "age" and "Increase inventory levels and safety stock" because p value is 0.018.

There is no relationship between age and other questions due to the fact that their p value is > 0.05.

There is no relationship between gender and other questions due to the fact that their p value is > 0.05.

TABLE 14. RELATIONSHIP BETWEEN LEVEL OF EDUCATION AND SELECTED QUESTIONS

	Level of Education	
	Chi-Square	p value
The majority of the decisions concerning the supply chain risk management are taken by both my company and the supplier	22.047	0.037
Use both regional and global strategy	21.865	0.039

According to the chi-square test, there is a relationship between "level of education" and "the majority of the decisions concerning the supply chain risk management are taken by both my company and the supplier".

There is also a relationship between "level of education" and "use both regional and global strategy" since both p values are lower than 0.05.

TABLE 15. RELATIONSHIP BETWEEN POSITION IN THE COMPANY AND SELECTED QUESTIONS

	Position In The Company	
	Chi-Square	p value
Costs due to laws and regulations of supplier's country	33.052	0.033
Rising labor costs	31.898	0.044
Costs due to the personnel of the supplier	36.403	0.014
Disruptions due to logistics with regards to delivery of product	34.141	0.025

According to the chi-square test; there is a relationship between "position in the company" and "costs due to laws and regulations of supplier's country".

There is a relationship between "position in the company and "rising labor costs".

There is a relationship between "position in the company" and "costs due to the personnel of the supplier".

There is a relationship between "position in the company" and "disruptions due to logistics with regards to delivery of product" since their p value is < 0.05.

TABLE 16. RELATIONSHIP BETWEEN REGION OF TRADE AND SELECTED QUESTIONS

	Region of Trade	
	Chi-Square	p value
Europe * The majority of the decisions concerning the supply chain risk management are taken by our supplier	9.618	0.047
Fareast Asia * My company is concerned about supply chain risks	11.307	0.023
Fareast Asia * Our suppliers take part in our supply chain risk management activities	9.58	0.049
Fareast Asia * My company trust its suppliers	9.673	0.046
Fareast Asia * Pursue supplier collaboration	11.783	0.019
Middle east * Is your company involved in any plan about supply chain risk management	4.761	0.029
Africa * natural disasters occurred in the supplier's country	13.106	0.011
Africa * proximity to the region of conflict(ex; situation in the middle east)	13.651	0.008

According to the results in Table 16, there is a relationship between "Europe" and "the majority of the decisions concerning the supply chain risk management are taken by our supplier".

There is a relationship between "Fareast Asia" and "my company is concerned about supply chain risks".

There is a relationship between "Fareast Asia" and "our suppliers take part in our supply chain risk management activities".

There is a relationship between "Fareast Asia" and "my company trust its suppliers".

There is a relationship between "Fareast Asia" and "pursue supplier collaboration".

There is a relationship between "Middle east" and "Is your company involved in any plan about supply chain risk management".

There is a relationship between "Africa" and "natural disasters occurred in the supplier's country".

There is a relationship between "Africa" and "proximity to the region of conflict (ex; situation in the middle east)".

There is no relationship between region of trade and other questions due to the fact that their p value is > 0.05.

CHAPTER 4

4. CONCLUSION

SMEs compose the dominant majority of most economies' firms and job. SMEs play key roles as job generators, innovators and exporters as well. Not only do they act as a source of future LEs, but they also fill economies with agility and adaptability. There is a number of benefits offered to SMEs which have established GSCM. The benefits of GSCM includes shorter lead times, fewer operational disruptions, reduced inventory, better quality and customer service, faster innovation, and reduced risk (Arend and Wisner 2005; Fawcett et al. 2009; Vaaland and Heide 2007).

The purpose of this study was to determine and analyze the global supply chain risks in SMEs. Therefore, this study helps to figure out the global supply chain risks that SMEs face in their business world. Along with this, the perceptions and attitudes of SMEs in Turkey towards the strategies to avoid/mitigate risks is determined by means of questionnaire.

In this research there are 62 companies. Almost all participants who answered the questions are males. There is only 1 female who answered the questions. Majority of the entrepreneurs (78.6%) are young people. Entrepreneurs are educated people with the level of education for graduates (26.7%) for vocational school graduates (6.7%) and for undergraduates (56.7%). More than half of the companies are incorporated (53.3%). The majority of the companies filled in the questionnaire are from İstanbul (71%). Majority of the entrepreneurs are export managers (29.3%) and owners (24.1%) of the companies.

Majority of the sectors of participated companies are textile (16.7%) and food (15%) respectively. The highest percentage of the companies has business with Europe (27.1%). It is followed by Middle East (24%) and Africa (20.2%). Little business is made in Fareast region (13.2%). The results indicate that the survey covers almost all the regions which

companies in Turkey have business with. It makes the research more reliable.

More than half of the companies (54.8%) employ 1-5 people who can speak foreign language.

As for the management of supply chain, only 5% of the companies have independent SCM unit. Majority of the companies assign either general manager (40%) or purchasing department (35%) for this task. There is a need to establish an independent SCM unit to focus on the issues related to supply chain.

34.7% of the companies prefer to communicate by means of telecommunications (telephone, e-mail, et.) rather than to have face to face meetings.

The companies believe that currency fluctuations pose the highest risk (4) on their business. It is followed by raw material price fluctuations (3.82) and inability of the supplier to meet standards and quality (3.78). On the other hand, cyber-attacks (2.59) and unplanned IT disruptions such as computer and its operating system's issues, etc. (2.67) pose the least risk on the business of the companies.

Nearly half of the companies (52.5%) allocated budget for supply chain management. However, more than half of the firms (59.4%) allocate only 1-5% of the annual turnover of the company.

Almost half of the companies are concerned with global supply chain risks. Most of the companies (3.79) believe that formal document must exist to describe the methods of work between their company and the suppliers.

Majority of the firms (3.82) find it easy to replace their supplier/suppliers in case a need arises. According to companies (3.50), majority of the decisions concerning the supply chain risk management are taken by themselves. Companies (3.68) trust their suppliers in general.

A significant number of companies are affected by supply chain disruptions. There are a number of strategies implemented by the companies to mitigate the supply chain risks.

Majority of the companies definitely give importance to make to order policy (3.95) and dual sourcing strategy (3.82). They are followed by collaboration with suppliers (3.77) as the third important strategy to be adopted.

Giving importance to geographical proximity to suppliers (2.95) and establishing distribution centers in multiple regions (2.87) are the two strategies with least importance.

In terms of Cross-Tabulation Analysis, significant results are as follows:

According to type of foreign trade; the impact of currency fluctuations and inability of the supplier to adapt changes on demand fluctuation and the variety of the product is evident on the companies which are both importing and exporting. However, it affects particularly exporting companies. Supply chain disruptions is another factor affecting the both exporting and importing companies 'overall performance. Lowering the price of the product as a risk mitigating strategy is adopted particularly by importing companies.

According to nature of business; supplier collaboration and establishing distribution centers in multiple regions is an important strategy for the companies, especially in food and textile sectors.

According to region of trade; companies, which do business with Europe, do not agree that majority of the decisions concerning the supply chain risk management are taken by their supplier. Majority of the companies, doing business with Fareast countries, are concerned about supply chain risks. Nearly half of the companies, doing business with Fareast countries, state that their suppliers take part in our supply chain risk management activities. More than half of the companies, which do business with Fareast countries, do trust their suppliers. Majority of the companies, doing business with

Fareast countries, use pursue supplier collaboration as a risk mitigating strategy. Majority of the companies, doing business with Middle East countries, is involved in supply chain risk management. More than half of the companies, which do business with Africa, believe that natural disasters occurred in the supplier's country are posing risk to their business. Majority of the companies, doing business with Africa think that proximity to the region of conflict is posing risk to their business.

According to age; proximity to the region of conflict (ex; situation in the Middle East) and increasing inventory levels and safety stock are important strategies for the young respondents (20-30).

According to level of education; mostly educated representatives of the companies choose "using both regional and global strategy". As for the relationship between the company and the suppliers more educated respondents state that "the majority of the decisions concerning the supply chain risk management are taken by both my company and the supplier".

According to position in the company; most of the export managers believe that costs due to laws and regulations of supplier's country have negative impact on the companies.

Mostly owners and export managers think that rising labor costs, costs due to the personnel of the supplier and disruptions due to logistics with regards to delivery of product are major risks threatening the companies among others.

In this research, an important part of thesis is dedicated to the review of literature. What is inferred from literature review is the significant role of establishment of GSCRM for the SMEs to become successful in rapidly changing global economy.

This research has made it clear that SMEs in Turkey are in need of GSCRM. By understanding its crucial role, enterprises will take advantage of GSCRM to be globally competitive.

In this thesis, our aim was to analyze the global supply chain risks in SMEs in Turkey. As a result of the study and the survey, the following findings have been obtained:

- The SMEs in Turkey lack an independent SCM unit.
- Currency fluctuations, raw material price fluctuations and inability of the supplier to meet standards and quality are perceived as the major risks for the SMEs in Turkey.
- It is easy for the companies to replace their supplier(s) when needed.
- SMEs give importance to the existence of formal document between companies and suppliers.
- Supply chain disruptions do affect the overall performance of the SMEs.
- Majority of the companies do not have regular meetings. Lack of face to face meeting may result in conflicts and lack of trust.
- SMEs follow "make to order", "dual sourcing" and "collaboration with suppliers" strategies respectively.
- "Establishing distribution centers in multiple regions" and "giving importance to geographical proximity to suppliers" are not regarded as a risk mitigating strategy for SMEs in Turkey.

The above-mentioned findings indicate that there are some measures to be taken and improvements to be done by SMEs and government institutions as well. Below is the list of some recommendations which might be useful for SMEs:

- Sectoral institutions and chambers can help SMEs get technological innovations and supply qualified workforce and establish industry.
- Government institutions should assist SMEs to overcome financial problems by providing them loans from the state and private

banks at lower interest rates, implementing less bureaucracy, allocating budget and incentives for SMEs to start business, etc.

- Governmental institutions can also help SMEs provide Research and Development, training, and consultancy support. Some of these programs are offered by KOSGEB, There should be continuous flow of information from these institutions about their activities so that SMEs will get benefit from such programs.
- On the other hand SMEs should establish an independent SCM unit to coordinate partners in the supply chain for the smooth flow of products, information and finance to meet the demands of ultimate user. With the help of SCM, companies will get to know the possible risks that they may face and develop strategies accordingly.
- SMEs should organize regular meeting with their suppliers to talk the issues and business related problems in details. In order to prevent from being affected by supply chain disruptions, SMEs should seek dual sourcing strategy. Stockpiling and safety stock strategy can also be applied so that the effect of currency fluctuations and raw material price fluctuations may be minimized.

To survive and keep going in the twenty-first century global economy, SMEs must learn how to adapt to today's environment that is encountered with challenging global supply chain risks. In other word companies must find a new way of operating that gives them the agility to respond swiftly to unexpected changes. Transforming the business to achieve in this competitive environment is a must. In essence, adapt or die (Heinrich and Betts, 2003). Therefore, to achieve, companies must look towards implementation of GSCRM to become resilient to sudden disruptions in their global supply chains.

APPENDIX A

QUESTIONNAIRE

Dear Sir/Madam,

This questionnaire is prepared to be used in a thesis in Master of Arts with a title of "**An Analysis of Global Supply Chain Risks in Small and Medium-Sized Enterprises**".

It can be completed in 10-15 minutes.

All the information provided will be kept confidential, and used for academic purposes without disclosing the name of the company. Your answers to the questions will play significant role for the thesis to attain its goal.

I would like to thank you for your contribution to my work.

SUPPLY CHAIN AND SUPPLY CHAIN MANAGEMENT

Supply chain concept includes flow of materials, information, services and finance from supplier to ultimate consumer. Global supply chain encompasses all the marketing activities of the importing or exporting companies during the process from supplying the raw materials to delivering to the end user.

1. Section. Profile of the Company and Supply Chain Management

1. Which of the following is the type of your foreign trade?

( ) Export ( ) Import ( ) Both

2. What is the nature of your business?

( )Food	( )Textile	( )Furniture	( )Service	( )Manufacturing of machinery equipment
( )Electricity and lightning	( )Packaging	( )Plastics	( )Automotive	( )health
( )Construction	( )Heating-cooling	( )Computer software	( )Glassware	( )Jewelry
( )Tourism	( )Agriculture-livestock	( )Energy	( )Marine	( )Chemistry

Other (please specify)……

3. What is the region of your foreign trade?

( ) Europe

( ) Middle East

( ) Fareast Asia

( ) Africa

( ) Russia and Central Asia

Other (please specify)……

4. How long has your company been in business?

( ) 1-10 years

( ) 11-20 years

( ) 21-30 years

( ) more than 30 years

5. How many people work in your company?

( ) 1-50 ( ) 51-100 ( ) 101-250 ( ) more than250

6. How many people who can speak foreign language do you employ?

( ) 1-5

( ) 6-10

( ) 11-20

( ) more than 20

( ) None

7. Who is currently responsible for the management of supply chain in your company?

( ) General Manager

( ) Production department

( ) Department of export/import

( ) Purchasing department

( ) Department of finance

( ) Independent supply chain management

( ) Department of logistics

( ) Other (please specify) _____

8. What is the means of communication of the person in charge of Supply Chain Management with your suppliers? (You can tick more than one)

( ) Regular meetings

( ) Regular visits

( ) Irregular visits

( ) Irregular meetings

( ) Telephone, internet, etc.

( ) Other (please specify) _____

2. SECTION Risks Faced in Global Supply Chain

The list of possible risks in global supply chain is given below. Please tick the corresponding box appropriate for your company.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	1	2	3	4	5
1. Delays due to laws and regulations of supplier's country	☐	☐	☐	☐	☐
2. Costs due to laws and regulations of supplier's country	☐	☐	☐	☐	☐
3. Political instability of the supplier's country	☐	☐	☐	☐	☐
4. Natural disasters occurred in the supplier's country	☐	☐	☐	☐	☐
5. Proximity to the region of conflict(ex; situation in the middle east)	☐	☐	☐	☐	☐
6. Financial difficulties or bankruptcy of supplier	☐	☐	☐	☐	☐
7. Rising labor costs	☐	☐	☐	☐	☐
8. Raw material price fluctuations	☐	☐	☐	☐	☐
9. Change in technology(ex; failure to update the technology used in the company)	☐	☐	☐	☐	☐
10. Unplanned IT disruptions (computer and its operating system's issues)	☐	☐	☐	☐	☐
11. Counterfeiting and patent issues	☐	☐	☐	☐	☐
12. Telecommunications outages	☐	☐	☐	☐	☐
13. Cyber attacks	☐	☐	☐	☐	☐
14. Energy/fuel prices volatility	☐	☐	☐	☐	☐
15. Raw material supply disruptions	☐	☐	☐	☐	☐
16. Currency fluctuations	☐	☐	☐	☐	☐
17. Inability of the supplier to meet standards and quality	☐	☐	☐	☐	☐
18. Delays due to personnel of the supplier	☐	☐	☐	☐	☐
19. Costs due to the personnel of the supplier	☐	☐	☐	☐	☐
20. Disruptions due to logistics with regards to delivery of product	☐	☐	☐	☐	☐
21. Inability of the supplier to adapt changes on demand fluctuation and the variety of the product	☐	☐	☐	☐	☐

3. SECTION Global Supply Chain Risk Management

Global Supply Chain Risk Management is defined as the management of risks which cause disruptions in the flow of information, materials, service and finance across the supply chain partners. The aim of Global Supply Chain Risk Management is to determine and assess the risks, and develop strategies to mitigate these risks.

1. Is your company involved in any plan about supply chain risk management?

( ) Yes ( ) No

2. Is a budget allocated for supply chain risk management?

( ) Yes ( ) No

3. If the budget is allocated, what is the amount in percentage of turnover?

( ) less than 2% ( ) 3-5% ( ) 6-10% ( ) 10-15% ( ) more than 15%

Following is the list of statements which shows the relationship between your company and your suppliers. Please tick the appropriate box for your company.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	1	2	3	4	5
1. My company is concerned about supply chain risks	☐	☐	☐	☐	☐
2. Our suppliers take part in our supply chain risk management activities	☐	☐	☐	☐	☐
3. Formal document exists to describe the methods of work between my company and the suppliers	☐	☐	☐	☐	☐
4. Ending the relationship with our supplier would have series consequences for our business	☐	☐	☐	☐	☐
5. If this relationship was stopped it would be easy for my company to replace the supplier	☐	☐	☐	☐	☐
6. The majority of the decisions concerning the supply chain risk management are taken by our supplier	☐	☐	☐	☐	☐
7. The majority of the decisions concerning the supply chain risk management are taken by my company	☐	☐	☐	☐	☐
8. The majority of the decisions concerning the supply chain risk management are taken by both my company and the supplier	☐	☐	☐	☐	☐
9. My company trust its suppliers	☐	☐	☐	☐	☐
10. Supply chain disruptions have negative impacts on my company's and financial performance	☐	☐	☐	☐	☐
11. Supply chain disruptions have negative impacts on my company's overall performance	☐	☐	☐	☐	☐

4. **SECTION Strategies to mitigate global supply chain risks**

A list of some strategies to mitigate global supply chain risks is given below. Please tick the appropriate box for your company.

	Strongly Disagree	Agree	Neither Agree nor Disagree	Agree	Strongly Agree
	1	2	3	4	5
1. Implement dual sourcing strategy	☐	☐	☐	☐	☐
2. Pursue supplier collaboration	☐	☐	☐	☐	☐
3. Use both regional and global strategy	☐	☐	☐	☐	☐
4. Follow make to order policy	☐	☐	☐	☐	☐
5. Increase inventory levels and safety stock	☐	☐	☐	☐	☐
6. Use component substitution strategy	☐	☐	☐	☐	☐
7. Lower the price of the product	☐	☐	☐	☐	☐
8. Establish distribution centers in multiple regions	☐	☐	☐	☐	☐
9. Give importance to geographical proximity to suppliers	☐	☐	☐	☐	☐
10. Focus on advertisement and marketing.	☐	☐	☐	☐	☐

5. SECTION. Information about Respondent

Age:	----------					
Gender:	( ) Male	( )Female				
Level of education:	( ) Primary school	( ) Middle school	()High school	( ) Vocational school	( )Undergraduate	( ) Graduate
Legal structure of the company	( )Incorporated	( ) Joint-stock	( )Other:----------			
Position in the company:	( ) Owner	( ) Member of board	( ) General Manager	( )Export Manager	( ) Import Manager	( ) Other: ----------
City/location of the company	----------					

Student

Ayhan ULUOCAK

Fatih University

ayhanuluocak@yahoo.com

Thesis Adviser

Yrd. Doç. Dr. Mehmet BASTI

Fatih University

APPENDIX B

ANKET

Sayın Yetkili,

Bu anket "Küçük **ve Orta Ölçekli İşletmelerin Global Tedarik Zincirinde Karşılaştıkları Risklerin Bir Analizi** "konulu yüksek lisans tez çalışmasında kullanılmak üzere hazırlanmıştır.

Anket 5 sayfadan oluşmakta olup yaklaşık olarak 10 - 15 dakikada tamamlanabilmektedir.

Vereceğiniz bilgiler tamamen gizli tutulacak, kişi ve kurum adı anılmaksızın akademik amaçlı kullanılacaktır. Araştırmanın gerçekleri yansıtması ve amacına ulaşabilmesi için vereceğiniz cevaplar büyük önem taşımaktadır. Bu çalışmaya katkılarınızdan dolayı teşekkür eder saygılarım sunarım.

TEDARİK ZİNCİRİ VE TEDARİK ZİNCİRİ YÖNETİMİ

Tedarik zinciri kavramı hammadde alımından, nihai ürünün tüketiciye ulaştırılması arasında gerçekleşen tüm faaliyetleri kapsamaktadır. Global Tedarik zinciri kavramı ile kastedilen ise bahsedilen hammadde tedarikinden ürünün nihai tüketiciye ulaştırılması süreçlerinde ithalat ya da ihracat yoluyla uluslararası pazarda işlemler yapan işletmelerin faaliyetleri kastedilmektedir.

1. BÖLÜM İşletmeye ait genel bilgiler ve Tedarik Zinciri Yönetimi

1-İşletmeniz aşağıdaki dış ticaret işlemlerinden hangisini yapmaktadır?

( ) İthalat ( ) İhracat ( ) Her İkisi

2- İşletmeniz hangi sektörde faaliyet göstermektedir?

( )Gıda	( )Tekstil	( )Mobilya	( )Hizmet	( )Makine Ekipman İmalat
( )Elektrik ve Aydınlatma	( )Ambalaj	( )Plastik	( )Otomotiv	( )Sağlık
( )İnşaat	( )Isıtma-soğutma	( )Bilgisayar-yazılım	( )Cam-porselen-seramik	( )Takı ve mücevherat
( )Turizm-seyahat	( )Tarım-hayvancılık	( )Enerji	( )Denizcilik	( )Kimya

Diğer (Lütfen belirtiniz)_____

3. İşletmeniz dış ticaret işlemlerini hangi bölgede gerçekleştirmektedir?
( ) Avrupa
( ) Ortadoğu
( ) Uzakdoğu Asya
( ) Afrika
( ) Rusya ve BDT

Diğer (Lütfen belirtiniz)_____

4-İşletmeniz kaç yıldır faaliyet göstermektedir?
( ) 1-10 yıl
( ) 11-20 yıl
( ) 21-30 yıl
( ) 30 yıldan fazla

5-İşletmenizde kaç kişi çalışmaktadır?
( )1-50 b)51-100 ( )101-250 ( )250 den fazla

6-İşletmenizde iyi derecede yabancı dil bilen kaç personel istihdam ediyorsunuz?
( ) 1-5
( ) 6-10
( ) 11-20
( ) 20'den fazla
( ) Hiç

7. İşletmenizde tedarik zinciri yönetiminden şu anda sorumlu kimdir?
( ) İşletmenin genel müdürü
( ) Üretim departmanı
( ) Dış ticaret departmanı
( ) Satınalma departmanı
( ) Finans departmanı
( ) Bağımsız tedarik zinciri yönetimi
( ) Lojistik departmanı
( ) Diğer (Lütfen belirtiniz) _____

8. Tedarik zinciri yönetimi biriminiz ya da sorumlusu tedarikçilerinizle ilgili aşağıdaki faaliyetlerin hangilerini yapmaktadır? (Birden fazla cevap verebilirsiniz)
( ) Düzenli toplantılar
( ) Düzenli ziyaretler
( ) Düzenli olmayan ziyaretler
( ) Düzenli olmayan toplantılar
( ) Telefon, E-posta, vb. iletişimi
( ) Diğer (Lütfen belirtiniz) _____

2. BÖLÜM Global Tedarik Zincirinde Karşılaşılması Muhtemel Riskler

Aşağıda bir global tedarik zincirinde karşılaşılması muhtemel riskler maddeler halinde belirtilmiştir. Bu risklerin işletmeniz için ne düzeyde etkili olduğunu belirtiniz.

	Hiç etkili değildir	Etkili değildir	Ne etkilidir ne de değildir	Etkilidir	Kesinlikle çok etkilidir
	1	2	3	4	5
1. Tedarikçinin ülkesinin getirdiği yasal zorunluluklardan kaynaklanan gecikmeler	☐	☐	☐	☐	☐
2. Tedarikçinin ülkesinin getirdiği yasal zorunluluklardan kaynaklanan maliyetler	☐	☐	☐	☐	☐
3. Tedarikçinin ülkesindeki siyasi istikrarsızlık	☐	☐	☐	☐	☐
4. Tedarikçinin ülkesinde yaşanan doğal afetler (deprem, yangın, vb.)	☐	☐	☐	☐	☐
5. Bölgesel istikrarsızlık (örneğin Ortadoğu ülkelerindeki durum vb.)	☐	☐	☐	☐	☐
6. Tedarikçinin finansal zorluklar yaşaması ya da iflas etmesi	☐	☐	☐	☐	☐
7. İşletmenin artan işçilik maliyetleri	☐	☐	☐	☐	☐
8. Hammadde fiyatlarındaki değişikler	☐	☐	☐	☐	☐
9. Teknolojideki değişim (İşletmenizde kullanılan teknolojinin güncellenmemesi vb.)	☐	☐	☐	☐	☐
10. Tedarikçinin bilgi teknolojisi altyapısında öngörülemeyen problemler (bilgisayar ve bilgisayar işletim sistemi arızaları vb.)	☐	☐	☐	☐	☐
11. Sahtecilik, taklitçilik ve patent sorunları	☐	☐	☐	☐	☐
12. İletişim problemleri	☐	☐	☐	☐	☐
13. Siber saldırılar. (Kullandığınız yazılımın bilgisayar korsanları tarafından çökertilmesi vb.)	☐	☐	☐	☐	☐
14. Enerji ve yakıt fiyatlarındaki değişkenlikler	☐	☐	☐	☐	☐
15. Hammadde tedariki konusunda yaşanan problemler	☐	☐	☐	☐	☐
16. Döviz kuru dalgalanmaları	☐	☐	☐	☐	☐
17. Tedarikçinin ürün ile ilgili kalite ve standartları sağlayamaması	☐	☐	☐	☐	☐
18. Tedarikçinin personelinden kaynaklanan bazı gecikmeler	☐	☐	☐	☐	☐
19. Tedarikçinin personelinden kaynaklanan maliyetler	☐	☐	☐	☐	☐
20. Tedarikçinin ürün teslimatı ile ilgili lojistik sorunları	☐	☐	☐	☐	☐
21. Tedarikçinin talep artışı ve ürün çeşidi ile ilgili değişikliklere uyum sağlayamaması	☐	☐	☐	☐	☐

3. BÖLÜM Global Tedarik Zinciri Risk Yönetimi

Tedarik Zinciri Risk Yönetimi; tedarik zincirindeki üyeler arasındaki düzenli bilgi, malzeme ve ürün akışı ya da hareketlerinin bir kısmını engelleyen ya da değiştirebilen risklerin yönetimi olarak tanımlanmaktadır. Tedarik Zinciri Risk Yönetimi'nin amacı bu riskleri tespit etme, değerlendirme ve gerçekleştiğinde etkisini minimuma indirme adına strateji üretme ve tedbirler almaktır.

1.İşletmenizde Tedarik Zincirinden kaynaklanabilecek Risklerin Yönetimi ile ilgili bir çalışma yapılmakta mıdır?
( ) Evet ( ) Hayır

2.İşletmenizde Tedarik Zincirinden kaynaklanabilecek Risklerin Yönetimi için bütçe ayrılmakta mıdır?
( ) Evet ( ) Hayır

3. Risklerin yönetimine bütçe ayrıldıysa bu bütçenin yıllık cirodaki yaklaşık yüzdesi nedir?
( ) %2 den az ( ) %3-5 ( ) %6-10 ( ) %10-15 ( )%15 den fazla

Aşağıda işletme ve tedarikçi ilişkisini gösteren ifadelere yer verilmiştir. Lütfen bu ifadeleri kendi işletmenizi göz önüne alarak önemlilik derecesine göre işaretleyiniz

	Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
	1	2	3	4	5
1. İşletmemiz tedarik zincirindeki risklere yönelik çalışmalar yapmaktadır.	☐	☐	☐	☐	☐
2. İşletmemizin Tedarik Zinciri Risk Yönetimi ile alakalı çalışmalarına tedarikçiler de dâhil edilmektedir	☐	☐	☐	☐	☐
3. İşletmemizin tedarikçileri ile arasında karşılıklı sorumlulukları belirleyen resmi bir sözleşme vardır	☐	☐	☐	☐	☐
4. Mevcut tedarikçimiz ile olan ilişkimizin sonlanması, işletmemizi ciddi şekilde etkileyebilir	☐	☐	☐	☐	☐
5. Eğer mevcut tedarikçimiz ile iş ilişkimiz biterse yerine rahatlıkla başka bir tedarikçi bulabiliriz	☐	☐	☐	☐	☐
6. Tedarik Zinciri Risk Yönetimi ile alakalı kararların çoğunu tedarikçimiz verir	☐	☐	☐	☐	☐
7. Tedarik Zinciri Risk Yönetimi ile alakalı kararların çoğunu işletmemiz verir	☐	☐	☐	☐	☐
8. Tedarik Zinciri Risk Yönetimi ile alakalı kararların çoğunu birlikte veririz	☐	☐	☐	☐	☐
9. İşletmemiz tedarikçilerine güvenir	☐	☐	☐	☐	☐
10. Tedarik zincirinde karşılaşılan aksaklık ve gecikmelerin işletmemiz üzerinde olumsuz parasal etkileri olmaktadır	☐	☐	☐	☐	☐
11. Global tedarik zincirindeki aksaklıklar işletmemizin performansını olumsuz yönde etkilemektedir.	☐	☐	☐	☐	☐

4. BÖLÜM Global Tedarik Zinciri Risklerini Azaltmaya Yönelik Stratejiler

Aşağıda tedarik zincirinde karşılaşılan riskleri azaltmak için uygulanması gereken bazı stratejiler maddeler halinde sıralanmıştır. Lütfen bu ifadeleri işletmenizi göz önüne alarak önemlilik derecesine göre işaretleyiniz.

	Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
	1	2	3	4	5
1. Alternatif tedarikçilerle çalışma stratejisini uygularım	☐	☐	☐	☐	☐
2. Tedarikçilerimiz arasındaki işbirliği ve uyumu gözetirim	☐	☐	☐	☐	☐
3. Hem bölgesel hem de global strateji uygularım	☐	☐	☐	☐	☐
4. Sipariş üzerine üretim yaparım	☐	☐	☐	☐	☐
5. Ürün stok miktarını ya da emniyet stok miktarını artırırım	☐	☐	☐	☐	☐
6. İkame ürün (başka üreticilerin aynı işi gören ürünleri) stratejisi uygularım	☐	☐	☐	☐	☐
7. Ürünün fiyatını düşürürüm.	☐	☐	☐	☐	☐
8. Farklı bölgelerde dağıtım merkezleri ya da depo kurarım	☐	☐	☐	☐	☐
9. Dağıtım merkezleri ve depoların tedarikçilere yakın bölgelerde olmasına dikkat ederim	☐	☐	☐	☐	☐
10. Ürünün reklam ve pazarlaması üzerine odaklanırım.	☐	☐	☐	☐	☐

5. BÖLÜM Anketi Dolduracak Yetkili İle İlgili Bilgiler

1. Yaşınız:	----------					
Cinsiyetiniz:	( ) Bay	( ) Bayan				
Eğitim durumunuz:	( ) İlkokul	( ) Ortaokul	( ) Lise	( ) Ön lisans	( ) Üniversite	( ) Lisansüstü
İşletmenizin hukuki yapısı:	( )Limited şirket	( ) Anonim şirket	( )Diğer:			
İşletmedeki göreviniz:	( ) İşletme sahibi	( ) Yönetim Kurulu Üyesi	( ) Genel Müdür	( )İhracat Müdürü/İhracat Sorumlusu	( ) İthalat Müdürü/İthalat Sorumlusu	( ) Diğer: ----------
İşletmenin bulunduğu il	----------					

Yüksek Lisans Öğrencisi
Ayhan ULUOCAK
Fatih Üniversitesi
ayhanuluocak@yahoo.com

Danışman Öğretim Üyesi
Yrd. Doç. Dr. Mehmet BASTI
Fatih Üniversitesi

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