DISSERTATION REPORT

ON

RISK MANAGEMENT OF SUPPLY CHAIN MANAGEMENT: A CASE STUDY ON NITOL MOTORS LTD.

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Semester: Summer-2022
PROGRAM: Executive master of business administration (Major In SCM)

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SUBMITTED TO

DEPARTMENT OF BUSINESS ADMINISTRATION
SONARGAON UNIVERSITY

Submitted in partial fulfillment of the award of the degree of SCM

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Date of Submission: August 8, 2022

Letter of Transmittal

Date: August 8’ 2022

Amir Husen
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Subject: Submission of dissertation report.

Dear Sir,

I am here by submitting my dissertation report entitled **RISK MANAGEMENT OF SUPPLY CHAIN MANAGEMENT:A CASE STUDY ON NITOL MOTORS LTD,** which was assigned to me as a requirement for the completion of the EMBA Program. I have discovered this study very interesting, beneficial and insightful.

The entire report is based on my practical experience in Nitol Motors ltd. I expect this paper to be informative as well as comprehensive. This report will help me a lot in my future career.

Thank you very much for your guidance and cooperation during the course without which this dissertation reportcannot be completed. Moreover, if you have any further enquiry concerning any additional information, I would be very pleased to clarify that.

Yours sincerely

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ACKNOWLEDGEMENT

First of all, we would like to pay our earnest gratitude to the almighty Allah for his endless blessing and mercy. The almighty gives us enough hardworking capability and persistence which allowed me to complete this project work.

It is a real pleasure to express our deepest appreciation, sincere gratitude and heartiest gratefulness to our dissertation supervisor Amir Husen, Asst. Professor, Department of Business Administration, SU. For the endless hours of help, suggestion, ideas and advice during the development of this report. This encouragement and motivation helped me to overcome all the difficulties.

I would like to express my heartiest gratefulness to my entire teacher here at the Department of Business Administrations of Bangladesh. Discussion with many of them has enriched our conception and knowledge about this project work.

I also like to thank the many website owners who kept reading materials in the internet. This helped us to complete this report.

I would like to thank all SU faculties and staff for making friendly and fruitful co-operation time to time.

Finally, appreciations are placed before respectable parents, fellow classmates and friends for sharing their knowledge and ideas that contributed in accomplishing this report and to all who participates in many ways during this report.

ABSTRACT

In this research paper I try to find out the actual status of risk assessment and management involved in supply chain management of Nettle Motors Limited. Also, to determine the difference between actual conditions and SCM rules and regulations, because, management thinking has a significant impact on SCM and risk assessment.

From this study it can be said that there is an urgent need to increase awareness and education on the mentioned points. Proper management strategy is required to ensure proper and risk free SCM operation. For further studies, more information on impacts, disposal and management needs to be collected to arrive at a clear conclusion.

Information and examples should be collected from developed country or countries, which are involved in managing and managing scheme risk. Find alternatives and appropriate technologies to develop SCM strategies. Comprehensive studies are needed on assessing and managing these risks involving aspects of supply chain management. As a result the company will be risk free.

EXECUTIVE SUMMARY

The main purpose of the internship is to fulfill the requirements of the MBA program as prescribed by PU. An intern has to prepare a project report at the end of the internship period but the main purpose of the internship is to gain real-world organization experience. Internship is done to gain practical knowledge in supply chain department of my organization.The first task I was given during these four weeks of internship was to gain practical knowledge of how supply chain operations are done. Second, I was assigned supply chain work during my internship program. As an intern, I realized that I was successful in gathering many important learning experiences that will be helpful in my future career. The supply chain department of Nitol Motors gave me ample space and opportunity to not only learn but also to showcase my skills as a member of the supply chain team. I can use my theoretical knowledge about supply chain in real practice while participating in many discussions. I was actively involved in departmental meetings where I shared my knowledge and opinion regarding the performance in Supply Chain Division of Nettle Motors. I tried to gather more information about the basic work functions of other departments to better understand the relationship between them and the supply chain department. It was admirable how wholeheartedly they welcomed, acknowledged and appreciated new ideas and knowledge.

I have provided few recommendations based on my understanding and knowledge.

I successfully completed all assigned duties and handed over to senior supervisors at the end of the internship. Thoroughly enjoyed the challenge each day. During my internship I managed to do some small improvisations that left their mark. This lesson I learned will be a valuable one for my future endeavors.

LIST OF ACRONYMS

MBA	**Masters of Business Administration**
SU	**Sonargaon University**
OB	**Organization Behavior**
SMC	**Supply Chain Management**
SM	**Supplementary Materials**
SCRM	**Supply Chain Risk Management**
TQM	**Total Quality Management**
OSC	**Optical Strength Meter**

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CHAPTER 1

INTRODUCTION

1.1 Background of the study:

In order to improve performance as well as remain competitive in market risk, the most important and valuable means is efficient supply chain management. Thus, firms remain competitive in the market as there is great competition for SCM among firms. In the early 1990s, the global market was under intense competition to provide the right product or service at the right time and at the right place, taking into account risk factors.
The global vehicle business has now become competitive in the local market due to which work should be done to enhance the overall performance of the industry and its supply chain. So, for this purpose, now the vehicle business needs to understand the concepts and practices of supply chain management to increase competitiveness and overall profitability.
At the same time, risk assessment and management involvement in supply chain management should identify and seek solutions. Supply chain management involves the culture, vision, strategy and processes to manage the best possible flow of money, quality and other components from innovative and reliable resources and suppliers and then deliver the high quality products they produce to customers. At very competitive prices.
Supply chain management has grown in importance in running a vehicle business as it is now recognized as an essential tool for achieving success in high competition.
Further, with the development of communication and information technology, it has also become a challenge to provide and share information in real time as this element has a great impact on the overall supply chain performance in these industries.
The system also provides public information that helps achieve industry goals.

1.2Risk evaluation and management involvement Statement:

Continuous variations also include the fact that organizations deal with increased volume and greater information diversity Thus, organizational managers have great concern about risk assessment and management involvement in the information they have for decision-making and planning purposes. Most companies need to address changing customer demands and environmental volatility but many disturbances can affect production and its processes, such as changes in demand patterns, vehicle models, financial fluctuations and more.
Thus, the variability of uncertainty should also be addressed.
Many companies are increasingly adopting strategic supplier partnerships to develop inter-organizational collaboration in their supply chains. There are some major challenges and some successes associated with the way they manage and control inventory levels.It also depends on how it affects customer satisfaction because it remains unknown how partners and companies' collaboration with different marketers and suppliers affects organizational performance and supply chain risk.
Firms are encouraged to share information, but because of management involvement in matching demand and supply, and the benefits and costs to firms, information sharing may vary.
However, it has become an urgent matter for organizations to select an appropriate deferral strategy to manage some of their major risks related to information uncertainty.
Under condition E, decision makers will call only those personnel who are experienced and skilled in assessing the degree of trust. Under this condition, decision makers will call only those personnel who are experienced and skilled in assessing the degree of trust.
So far, the degree of support provided by online platforms to risk management and management engagement relationships has not been investigated in depth. This is so because assessing the true contribution of these elements is really problematic.
Although the current context has previously been studied around the world, it is studied in depth in Dhaka, Bangladesh, specifically in the context of the vehicle business of Nitol Motors Limited.

1.3 Significance of the study:

The aim of this study is to investigate a model describing an association between organizational performance and supply chain management practices. SCM practices are known as activities performed by organizations to effectively manage their risk assessment and management involvement in their supply chains and practices. This study focuses on various and diverse aspects of supply chain management.
However, due to the lack of a formal model, incorporating these activities at the downstream and upstream levels and linking these activities to organizational performance as well as competitive advantage has not been possible in previous studies. In this study, it is hypothesized that studying supply chain management practices from downstream and upstream, will help practitioners as well as researchers to better understand the scope and activities related to supply chain management and will enable researchers to study the results of supply chain management.
By providing a valid model for studying supply chain management practices and generating empirical results on the impact of risk management on organizations' competitive advantage and performance, it is assumed that this study will provide some useful guidance for studying and implementing SCM practices. organizations and to further support research in this area.
In addition to this, by providing a multi-dimensional measurement of SCM practices and defining its overall ability to improve organizational performance and gain competitive advantage, this study has given SCM managers some important tools to assess the prevalence of current practices in supply chain management. As a result, the way of managing the activities of an organization becomes easier.

1.4 Scope of the Study:

SCM practices provide a number of concepts that encompass the upstream and downstream segments of the supply chain. This study includes variables in customer relationships, strategic supplier partnerships, quality information sharing, level of information sharing, organizational performance and postponement.
Operational measures for the variables were empirically designed and analyzed using data collected from respondents to a survey.
The expected size of the research sample was collected from the vehicle business of Nitol Motors Limited. The hypothesized relationship was studied through structural equation modeling.

CHAPTER 2

ORGANISATIONAL PROFILE

2.1 Organizational profile

Supply Chain Management for Nitol Motors companies is co-ordination of people, properties, processes, vendors, information and resources to deliver products or services to the end customer. The SCM involves managing complete activities for buying, selling or renting land, buildings or housing.

Supply Chain Management can be done effectively with technology. The software solutions are well equipped with advanced analytics tools that analyze data from all departments of business. SCM can be used to create a more agile enterprise that can take decisions proactively to maximize business results. Here we look at how Nitol Motors Industry can use Supply Chain Management Solutions:

2.2 Managing Properties & Assets:

The Nitol Motors companies can use the SCM solution to manage their properties, plants, equipment's, land and buildings etc. All Fixed Assets including properties and other investments can be tracked using SCM Solution. The categorization of properties like commercial, residential, industrial, agricultural, sales, rental properties etc can be done an automated system.

2.3 Forecasting & Planning:

The Nitol Motors business requires thorough analysis of supply & demand for properties. The estate companies can use the software to manage the various property listings for rentals & sales etc. The active listings, enquiries on properties, ownership, tenant and lease details etc can be maintained using SCM system. The software can be used to analyze the demand for properties in various locations, their pricing, investment information etc.

2.4 Documentation & File Management:

The documents associated with the properties can be managed using the SCM System. All property listings can have associated documents for title or lease deeds, associated tenants, and ownership or investor data on the system. The documentation related to properties can be managed effectively using the SCM system. It effectively reduces the time for creating agreements and managing leases, especially for large properties. Nitol Motors companies and organizations use document management and digitization for meeting compliance needs without hassles.

2.5 Sourcing & Procurement:

One of the most pressing needs for organizations is to keep their inventory optimized. The SCM solution minimizes the gap between demand and supply for items. The optimized procurement is in line with the planned goals and milestones. The SCM system helps companies to operate with optimal inventory to reduce capital expenditure. At the same time, it ensures that all ongoing projects smooth effectively.

2.6 Purchase Orders & Vendor management:

The SCM System can automate purchase order creation, approvals, payments, performance management for vendors. Once the purchase orders are created, the payments for vendors can be done against milestones. The contracts, vendor payments and performance can be managed using SCM software. With the SCM System, companies are in a better position to negotiation with vendors; leverage bulk discounts and also manage vendor payments transparently.

2.7 Managing Partners, Locations and franchises:

The Nitol Motors businesses typically span across locations and cities. It also involves multiple stakeholders. Managing a multi-location business can be quite complex. With the SCM system, information gets centralized. The management can track the various locations and franchise data from any place. The location wise data, performance metrics and all information can be tracked using the SCM system.

2.8 Projects & Property Development:

Nitol Motorscompanies typically manage multiple properties and sites. Many a times, they also have to look at ongoing property developments and construction. The ongoing projects can be managed through the SCM system. Even when these projects are outsourced to other developers, the execution can be tracked using the SCM System. All property development & maintenance work can be managed using SCM system.

2.9 Streamlining Logistics & Warehouse :

The Nitol Motors companies need a state-of-the-art solution for managing their logistics and warehousing. The space utilization, consumption trends and availability of raw material for ongoing projects etc. can be automated using SCM system. A centralized system can track multiple warehouse locations, transportation channels and streamline logistics for companies.

2.10 Managing Compliance :

The regulatory compliance and adherence to law of the land is pivotal for Nitol Motors companies. The SCM system provides an effective workflow system for getting these approvals in order. When projects are planned, the tax implications on sourcing, developments and services need to be analyzed carefully. An SCM system analyses this data and provides predictive suggestions to companies for achieving the project outcomes in compliance with regulations.

2.11 Nitol Motors Solution :

SCM offers a complete Nitol Motors solution from planning to delivery. It can be used for planning & pricing of properties, suggestive sales figures, rentals and agreements etc. The system also makes use of data to provide predictive insights for Nitol Motors companies. The investments made, project delivery

milestones, quality control, service costs, property maintenance & pricing analysis can all be managed through the SCM system.

The leading Nitol Motors companies of the world rely on supply chain management solutions to deliver cutting edge offerings for their customers. Improving the supply chain can lead to minimized delays, Cost Optimization, Utilization of resources, faster response time, improved agility, better planning and co-ordination for Nitol Motors Industry.

Kreyon offers integrated, turnkey, customer centric Supply Chain Management software solutions for Nitol Motors companies. We are a leading Nitol Motors software development company helping clients with complete solutions. If you need any assistance or have any queries, please get in touch.

CHAPTER 3

Supply Chain Management System of the Nitol Motors Industry: A Study from Bangladesh Perspective

3.1.1Introduction:

The present modern world, in this new millennium, is becoming highly populated due to migration to developed countries while rural to urban migration and uncontrolled birth rates in this part of developing countries. Factors like globalization, labor mobilization, increasing cross border business flow, cultural diversity etc. have contributed substantially behind this trend of overpopulation. Vacant, agricultural and forest land is gradually being dispossessed. As a result, the income stream is decreasing.
In this trend, Bangladesh, being one of the most densely populated countries in the world, is in a challenging position to ensure that food grains and other goods reach their intended destinations for all. Migration from rural to urban and city areas for occupational engagement is an additional stress on the current challenge of population. Nitol Motors has cut back quite a bit through the vehicle business.
Realizing the important role of SCM in VBI, secondary data has been collected. The present work is unique in that it not only highlights the important issues of VBIs but also examines their role in mitigating business challenges in the country. However, the present study is not free from limitations. For example, the main limitation of the present study is that the secondary data in the literature review section did not focus only on the role of SCM of VBI in Bangladesh.
Moreover, the results of previous studies mostly show the SCM scenario of other countries rather than Bangladesh. Relatively few studies focus on this sector in Bangladesh. Thus, a precise understanding of the actual status of SCM factors of VBI in Bangladesh is yet to be obtained.
Again, some studies only focus on a few aspects of the subject matter of the current study. This is because some previous studies have adopted different qualitative frameworks or models while others have focused on individual variables related to VBI's SCM system.
To fill the knowledge gap left by previous studies, the present study explores the research question: "Is the vehicle business SCM system (VBI) effective in meeting the income and food needs of the population of Bangladesh? Here, in relation to the appropriate answer to the set research question, the current research is found to be unique and different from the previous research because by using correlation and mean analysis on individual variables,

the current research identified a positive relationship between SCM and management.
Income requirements of the population of Bangladesh. The significance of the identified variables was verified and proved through various statistical tests including reliability, validity, correlation and mean analysis.
In light of the above research questions, the main objective of this study is to check whether it is effective in managing the food supply and income requirements of the people of the country so that the respective vehicle companies can take appropriate measures to improve their quality. This work is arranged with different sections.

3.2 Background of Vehicle Business Industry in Bangladesh:

The vehicle business is the fastest growing sector of the country's economy with huge potential in the near future. Two of the main factors acting as the driving force behind the unprecedented growth of the vehicle business in Bangladesh are population growth in particular. The urban population of Bangladesh is growing faster than the population as a whole.
In 1970, the urban population was only 7.6% while in 2010 it was 27.1%. In 2030, it is projected to reach 39.3% (World Population Prospects: 2008 Revision, United Nations Population Division). This means that in the near future (by 2040) half of the total population will live in cities. Providing a source of food and income to these people will be a major challenge. It is also noted that with the increasing trend of population, people are directed towards cities.
In 1974, the number of immigrants was 2.43 million which was 3.44 percent of the total population of Bangladesh. Bangladesh Bureau of Statistics Latest Sample Vital Registration System (SVRS) 2008 reports that currently the rate of migration to Bangladesh is 30.62 per 1000 population while urban and rural migrants are 51.69 and 16.64 respectively.
Urban areas have higher migration than rural areas. All these together
Vehicular business has become an acute problem which has led to the growth and development of VBI in Bangladesh. This organization protects traders from fraudulent activities. It is expected that necessary measures will be taken for the growth of the sector. Vehicle business is emerging as a growing industry in Bangladesh contributing handsomely to the GDP.

3.3 Theoretical Framework:

A supply chain and source of income consists of all levels directly or indirectly involved in fulfilling a customer's request. But achieving this objective requires a well-managed supply chain.

Supply chain management is "the strategic and systematic coordination and techniques of these business functions within a particular firm and across businesses within a supply chain with the objective of improving the long-term performance of individual companies.

The supply chain as a whole. Material management, partnerships, have expanded the scope of SCM beyond information technology to areas of total quality management such as management commitment, organizational structure, training, and behavioral issues. and helps to cope with economic fluctuations.

Presented a model of an integrated business process, which highlights the importance of communication between processes and partners in the supply chain. Supply chain involves costs of conveying information, manufacturing materials, storing them, transporting them and transferring funds. The total cost of the supply chain continues to rise due to the huge capital expenditure required to run a global business and many parameters such as freight charges.

However, perfect planning in SCM regarding material arrival, production scheduling and distribution not only increases the income of the people of the country but also contributes to the development of the country.

3.4 Literature Review:

Raw land as the main feature of vehicle business is the focus of vehicle manufacturing and business expansion. Creating vehicle business opportunities for small investors. A study has shown that food transportation and unique cargo transportation is very important as a manpower and agriculture based country.

In this case, the name of Nitol Motors Limited is significant. A new feature of this industry is that both income and service work can be done at the same time. Transport system is very important for a country, which can make a country immobile and mobile.

CHAPTER 4

Supply Chain Risk Management

4.1 Abstract of Supply Chain Risk Management:

Therisksassociatedwithglobalsupplychainmanagementhascreatedadiscourseamong practitioners and academics. This is evident by the business uncertainties growing in supply chain management,whichposethreatstotheentirenetworkflowandeconomy.Thispaperaimstoreview the existing literature on risk factors in supply chain management in an uncertain and competitive business environment. Papers that contained the word "risk" in their titles, keywords, or abstracts were selected for conducting the theoretical analyses. Supply chain risk management is an integral function of the supply network. It faces unpredictable challenges due to nations' economic policies and globalization, which have raised uncertainty and challenges for supply chain organizations. Thesesignificantlyaffectthefinancialperformanceoftheorganizationsandtheeconomyofanation. Debateonsupplychainriskmanagementmaypromotecompetitivenessinbusiness.Riskmitigation strategies will reduce the impact caused due to natural and human-madedisasters.

4.2 Literature Review and ResearchDesign:

Thesupplychainnetworkconsistsoftrade-offsinterrelatedbymonetary,information, andmaterialflows. Manydisruptions insupplychainshave beenseen since the year 2000. These disruptions include the fear of weapons of mass destruction, terrorist attacks, fuel protests, and disease outbreaks. The risk is the probability of differences in expected outcomes. One can assign probabilities to various outcomes and calculate risk. However, uncertaintycannotbequantified.Riskmeansthatthereisuncertaintyabout an outcome. Hence, uncertainty refers to a risk that may not be eliminated. However, these uncertainties can be minimized with proper assessment and planning.

SCRMcanbedividedintotwobroadcategoriesofapproaches.Thefirstisthestrategy forcomprehensiveriskmanagementapproach,andthesecondisafocusedapproach to a specific disruption. These specific disruptions could be security or terrorism. Although these methods provided enormous value and insights, the events causing disruption were presumedtobeunintentional.Thelackofriskmanagingstrategiestounderstandthecause of disruption leaves a gap from a theoretical perspective, exposing firms to unavoidable risks in the environment. Children's toys contained lead-based paint in 2007 without the knowledge of Mattel. This caused disruptions in Mattel's supply chains. Mattel ended up setting quality assurance centers at the suppliers' factories to avoid the repetition of the lead paint crisis. The supplier used lead-based paint to save small operational costs. The cost of disruption to Mattel was much more significant and could have been avoided.

The remainder of the section is divided into four subsections. The first subsection reviews the past literature for various definitions of risk. The second subsectiondiscusses risk disruption in SCM caused by natural disasters or events which are beyond human control.Riskdisruptioncanoccurduetoweaksupplychainstrategies.Thethirdsubsection discusses risk management methods and strategies. The fourth subsection illustrates risk detection and risk mitigation in the supply chain network for a contingency plan and supplier evaluation to be carried for reducing

risk impact and achieving supply chain resilience (Figure1).

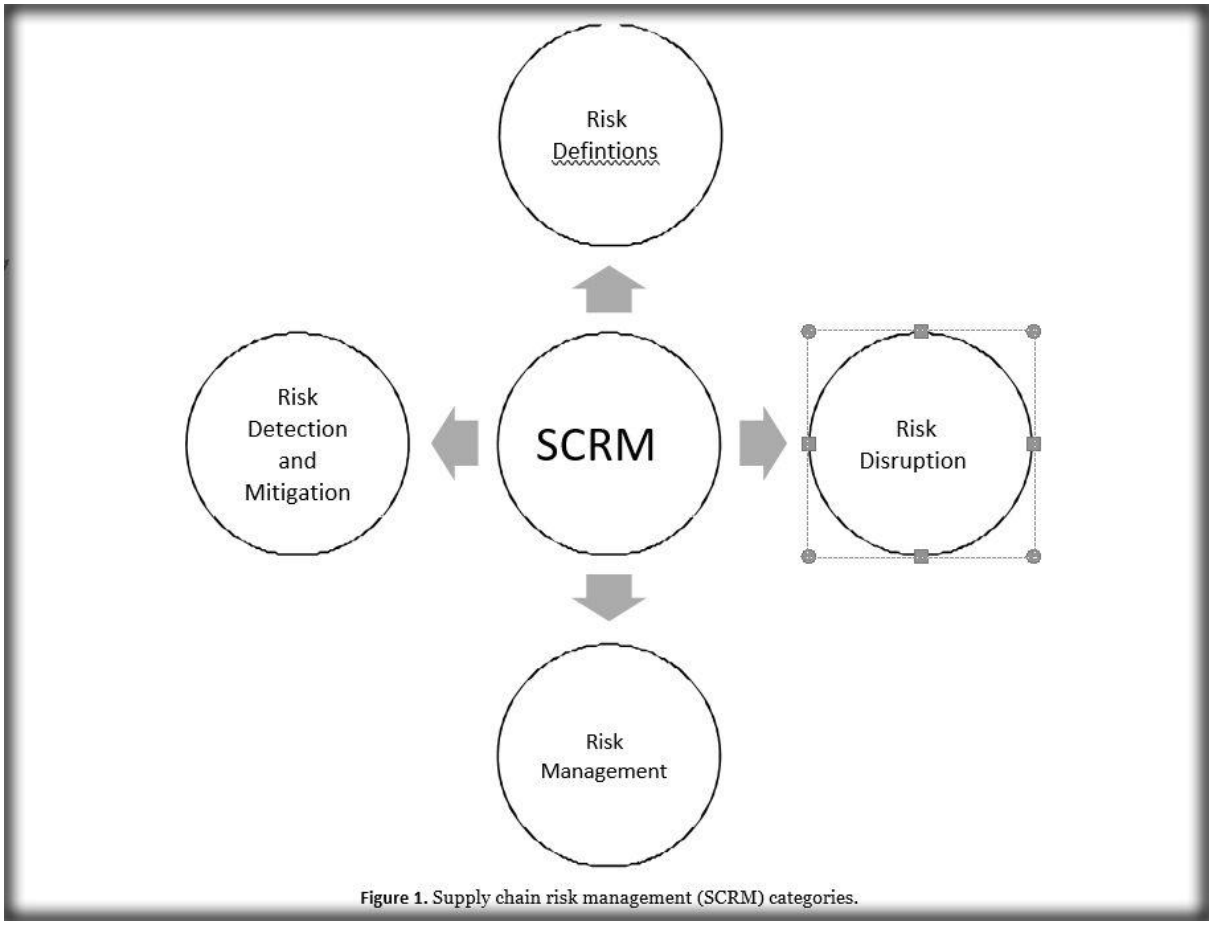


Figure 1. Supply chain risk management (SCRM) categories.

4.3 SCRMDefinitions

Thedefinitionsof"supplychainrisk"andSCRMare evolving. A universally acceptable definition helps to identify, measure the chances of risk and its effect on the supply chains. This helps in adopting the most effective SCRM strategies. Therefore, standard definitions are vital. Table1summarizes a few definitions of risk andSCRM.

Table2summarizesthefindingsandcontributionsofpastliteraturereviewson SCRM. Theauthorshaveusedvariousformsofliteraturereviewanalysis,andeachpaperisunique in itself, which leaves the gap for further literature research in the field ofSCRM.

Table 1. Definitions of Risk and SCRM.

Authors	Definitions
Bogataj and Bogataj (2007)	"The potential variation of outcomes that influence the decrease [in] value added at any activity cell in a chain."
Wagner and Bode (2006)	"The negative deviation from the expected value of a certain performance measure, resulting in negative consequences for the focal firm."
Norrman and Jansson(2004)	"To collaborate with partners in a supply chain apply risk management process tools to deal with risks and uncertainties caused by, or impacting on, logistics related activities or resources."
Tang(2007)	"The management of supply chain risks through coordination or collaboration among the supply chain partners so as to ensure profitability and continuity."
Jüttner(2005), Jüttner et al.(2010)	"The identification and management of risks for the supply chain, through a coordinated approach amongst supply chain members, to reduce supply chain vulnerability as a whole."
Goh et al.(2007)	"The identification and management of risks within the supply network and externally through a coordinated approach amongst supply chain members to reduce supply chain vulnerability as a whole."
Thun et al.(2011)	"Characterized by a cross-company orientation aiming at the identification and reduction [in] risks not only at the company level, but rather focusing on the entire supply chain."
Jüttner et al.(2010)	"Any risks for the information, material and product flows from original suppliers to the delivery of the final product for the end user."
Ellis et al.(2010)	"An individual's perception of that total potential loss associated with the disruption of supply chain of a particular item from a particular supplier."
	"The probability of an incident associated with inbound supply from individual supplier failures or the

Table 2. Literature reviews on SCRM.

Authors	Research Methodology	Key Findings/Contributions
Jüttner et al.(2010)	Focus group discussions, interviews, and statistical analyses.	Developed four basic conceptual constructs around risks
Khan and Burnes(2007)	Literature review	There is a need for analytical models
Natarajarathinam et al. (2009)	Literature review	Management of disruptions for rapid recovery needs improvements.
Rao and Goldsby(2009)	Literature review	Classification of risks into environmental, industry, and organizational risks
Tang and Musa(2011)	Literature survey and bibliographic analysis	There is a need for quantitative modeling in SCRM
Vanany et al.(2009)	Literature review from 2000 to 2007	Entreprise Resource Planning (ERP) will become a vital tool in SCRM. There is a need for collaborative strategies in SCM.
		The authors built theories by working on the different

4.4 Risk Management:

"Riskmanagementreferstostrategies,methods,andsupportingtoolstoidentifyand control risk to an acceptable level". Additionally, risk management canalsobereferredtoasasynchronizedsetofactionsandapproachestodirectanorganization to minimize the risk for achieving the organizational goals. Managing risks allows thedecision-makertounderstandandassesstheimpactofriskinasupplychainnetwork. Controlling complexity leads to higher cost efficiency and reduces risks. Early oil tankers had two interconnected storage compartments causing instability. This design made oil tankers susceptible to overturning. The design of oil tankers was modified to have more independent compartments to provide deep water stability, although it was

expensive to build such ships.

Supplychainsevolvebasedonthemarket'srequirementsormanufacturingplantsin different product development stages. Furthermore, to re-ducetheglobalsupplynetwork'sriskcausedbyincreasedeconomicengagementsbetween nations,regionalsupplychainscanreplaceglobalsupplychains.Forexample,theworld's largestdistiller(DiageoPLC,London,UK)isshiftingitssupplieranddistributionstrategy fromaglobalsupplychaintowardsamoreregionalsupplychainnetwork.Theyminimize risksbysourcinglocallyandincreasemarketshareandprofitsbyfocusingonlocalmarkets.
A manufacturing company (Li & Fung Limited., Hong Kong, China) ties up sub-contracts with various vendors spread mostly across southern Asia, which reduces the dependency on one supplier in times of crisis, focusing on improving efficiency and reducing the risks in supply chains. Such regional transitions were envisaged due to various risks in global supply chains. The estimation of risk can lead to better risk management, reduce the extent of damage, and improve supply chain resilience. Long term investment in a robust supply chain network in an organizationwill reduce operational costs and be flexible enough to the changing and competitivebusiness environment. Contingency plans to disruptions make companies resilient and provide a competitive advantage.

4.5 Risk Detection and Mitigation Strategies:

Riskdetectionplaysapivotalrolebeforedisruptionoccurs.Forcemajeuredisruptions arechallengingtomanagebutcanbeestimatedthroughconsciousriskassessmentstrategies identifying risk indicators, and applying the principles of Total Quality Management (TQM) in sharing information among SCM partners. Corporations should have contingency plans in the case of the occurrence of a disruptive event. Performance failures of a supply chain can be monitored through audits in an organization.
Toyotahaveappliedtheseprinciplesintheirsupplychainsandminimizedthedisruptionsduetoproductrecalls.
Strategiestocontrolriskmaybedividedintoseven categories: prevention,rescheduling,conjecture,numericalandeconomic,verticalintegration,risk-sharing,andtechnology and security. The prevention strategy is used when risks are linked with each product or its terrestrial markets, or close engagement with suppliers/customers is not possible. Divestiture of resources, delay of entry, or contributing to less ambiguous markets is prevention. Ensuring

flexibility and delay in spendingreferstorescheduling.Marketdemand,customizationofproducts or services, input costs, product life cycle, and product modularity affects rescheduling. The conjecture is the opposite of rescheduling and decisions are influenced by projected demand. Supply chain resources are leveraged to maximizethecompetitiveadvantageinservingthecustomers.Financialrisks are addressed through numerical and economic approaches. The numerical approach is for a large population, e.g., insurance. The occurrence of an event for many people at the same time requires an economic approach. A few risks incentivize vertical integration because vertical integration reduces the risks due to better supply and demand control. Opportunism and asset specificity, capacity constraints, and improved supplier–buyerpowerbalancearesuch incentives.
Contractswithflexibilityforpossiblechangesintheenvironmentreducesrisks.Designingflexiblecontractsacts

asacontrolmechanism. Outsourcing or offshoring transfers risks in SCM. Technology to detect nuclear, chemical, or biological elements exists and reduces the risk of carrying such shipments.

Organizations such as Container Security Initiative, Customs Trade Partnership Against Terrorism (CTPAT), and Operation Safe Commerce (OSC) act as instruments forglobalsupplychainsecurity.Thedetectionofalikelydisruptionfrom an unforeseen event is vital to risk mitigation. Therefore, SCRM facilitates a reduction in uncertainties and disruption while improving operational performance.

“A literature review is a systematic, explicit, and reproducible design for identifying, evaluating and interpreting the existing body of recorded documents”. Literature reviews consist of two purposes: firstly, they summarize the present research findings by classifying patterns, themes, and issues. Secondly, they help to identify the conceptual content of the field and contribute to theory development.

CHAPTER 5

Analysis and Findings

5.1 Analysis :

The total number of documents published in peer-reviewed journals in the English language that used "risk" in their titles, keywords, or abstracts in the EBSCO premium databasebetween2010and2019was455.ThisnumberincludespaperspublishedinABDC and non-ABDC journals (Table3). The papers published in non-ABDC journals were 143 (455/143 =31.43%).

Table 3. Document type for ABDC and non-ABDC journals.

Document Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Non-ABDC Journals											
Article	6	11	12	8	17	15	15	11	22	22	**139**
Case Study				1		1					**2**
Opinion							1				**1**
Interview									1		**1**
Non-ABDC Total	6	11	12	9	17	16	16	11	23	22	**143**
ABDC Journals											
Article	14	14	26	21	36	26	32	35	45	52	**303**
Case Study		1	1	1	1	1	2	2			**9**
ABDC Total	14	15	27	22	37	27	34	37	45	52	**312**
Overall Total	**20**	**26**	**39**	**31**	**54**	**43**	**50**	**48**	**68**	**74**	**455**

There were a total of 143 research papers published between 2010 and 2019 in non- ABDC journals. The papers were in the form of articles, case studies, opinions, and interviews.Therewere139articles,followedbyonecasestudy,andtherestwereopinions and interviews. Forty-four articles on SCRM were published in the last two years of the study period, which were the highest in any two years between 2010 and 2019 and accounted for more than 31% of thepublications.

Therewere312(312/455=68.57%)paperspublishedinABDClistedjournalsasanarticleoracasestudy(Table3). Thenumberofresearchpublicationsshowedseveralresearch paperspublishedonSCRMandtheimportanceofriskmanagementinthecompetitiveand unpredictable businessenvironment.

5.2 Discussions:

There were 303 research articles published in ABDC journals with nine case studies on the supply chain risks. However, no literature reviews were published. As stated earlier,thenumberofpublicationsonriskfactorsinsupplychainsincreasedbetween2010 and 2019 due to uncertainty and risk exposure. Economic engagements between nations due to globalization have sparked the need for efficient SCRM strategies to minimize the risk uncertainties.

Moreover, the papers were further analyzed into different ABDC ranking journal publications. Appendix illustrates a detailed classification of journals listed in the ABDC category.Therewere48A*categoryarticlepublicationsbetween2010and2019,compared to200AcategoryresearchpublicationsonSCRM.TheremainingBandCcategoryjournals had48and16researchpublications,respectively. Therefore,researchpublicationsintheA category have received the highest number of publications. The analyses were classified into the number of papers published in top journals since 2010. Seven journals topped the list in the maximum publications related to risk management in the supply chain. The *International Journal of Production Economics* (*IJPE*) had the most publications in the studied period(Table4).

The top journals can be further analysed based on the publication of more than ten research papers. Table5illustrates the combination of the number of papers published in the number of journals. The *International Journal of Production Economics* published by Elsevier has 41, followed by *the International Journal of Production Research* with 31 publications. This is provided in with the names of publishers.

Table 4. Top journal publications.

Journal Name	No. of Publications
International Journal of Production Economics	41
International Journal of Production Research	31
Journal of Cleaner Production	19
Computers and Industrial Engineering	19
European Journal of Operational Research	13
Benchmarking: An International Journal	11
Industrial Management and Data Systems	10

Table 5. Information on the number of journals and papers published.

Number of Papers Published	Number of Journals	Number of Papers in These Journals
More than 10	6	134
10	1	10
9	1	9
8	2	16
7	1	7
6	3	18
5	3	15
4	3	12
3	11	33
2	7	14
1	44	44
Total	**82**	**312**

5.3 Research Implications in SCRM:

Global supply chains require a retrieval plan to ease the effects of disasters.Thereneedstobeastrategicplan,becauseuncertaintiesandriskssur-roundthesupplychainenvironment.Therefore,quickrecoveryistheprimeobjectiveafterariskincidenthasoccurred.Theformationofsuitableriskrecoverymodelsalsoneedsplanning and a combination of information and human intervention. There are a few authors whohavesuggestedempiricallygroundedresearchtools inSCM,such as mathematical programming models and simulation models, analytical hierarchy processes. complexity and graph theories, and the development of models considering interdisciplinary re- searchfor further research inSCRM.

There are different payment processes in the imports and exports of goods. The two methods are prominent, namely, direct payment between the parties, and through a third party such as a bank. In the

case of advance payment, the financial risk in a supply chain is high, particularly for making payments to new vendors in different countries. Direct payment requires trust and relationships and is avoided where trust between the two
partiesisnotstrong.Insuchcases,partieschooseafinancialmediatory,suchasabank,to makethepaymentthroughaletterofcredit.Banksplayasignificantrole,butthisincreases thecostofsupplychains.Theprocessinvolvesconsiderabledocumentation,whichdelays the process and increases the risk due to currency fluctuations or trade embargoes.
Suggestthat assystemcan beprojectedforinnovative ideas to the ambiguous business environment. A cohesive approach to SCRM needs to incorporate risk issues from industry practice. Industry 4.0 is expected to significantlyimpactthevisibilityoftheSC.ModerntechnologiessuchasRadio-frequency identification (RFID), ERP, and General Packet Radio Service (GPRS) will become import-tanttoolsforSCRM. However, almost all shipping transactions involve many documents such as seller contracts, charterpartyagreements,billsoflading,certificatesoforigin,portdocuments,letterofcredit (LC),andmanyotherdocumentrelatedto vessel'sconsignment.
Identifyingandharmonizingstrategiesfordifferenttypesofriskisanessentialfactor for success in risk management. There needs to be a corrective
approachforrecurrentrisksforevaluatingthecostsofincreasingordecreasinginventories, capacity, flexibility, responsiveness, and capability. Managing disruptive risks will require designing supply chains where the resource in question (parts inventory or the number of suppliers) is never completely centralized. For instance, Samsung Electronics Co. Ltd. has two vendors to supply necessary electronic parts, even thoughthesecondvendorcontributesonlyabout20%ofthevolume. The implications of these principles are simple to understand. The benefit of having multiple fulfillment centers at various locations reduces the supply chain risk network without increasing the cost and minimizing the risk.

CHAPTER 6

Conclusions Recommendations

6.1 Conclusions:

Supply chains for the back bone of the global economy and promote trade, consumption, and economic growth. The changing phases of globalization, lean manufacturing processes, and outsourcing to low-income countries have made supply chain networks more efficient and changed their supply chain risk profile. Due to globalization, inter-supplychaincompetitionhasintensified;companiesstrivetodeliverthebestvaluetocustomers with greater efficiency at the lowest cost; communication with vendors/suppliers will play a vital role in many organizations. Supply chain cost reductions can be gained through optimally designed supply chain flows combined with goods' physical movement. This can be simplified by extending trade credit through conventional modes of distribution, reducing inventory levels, cost in supply chain management, and increase the access to trade finance organizations.

6.2 Recommendations:

This paper reviews the existing literature on SCRM and thee exploration of risk factors in SCM. In this paper, we reviewed 455 international journal articles appearing between 2010 and 2019 in SCRM. We further refined all these articles according to publications in the ABDC ranking list, which was around 312 articles with the document type(Table3)andtoppublishers(Table6)inSCRM.Furthermore,thenon-ABDClistof publications was considered to understand risk factors of SCM. The total number of papers published in the non-ABDC journals list was 143 (Table3). This comprehensive classificationofpublicationsintopjournalscouldhelpresearchersconductmoredetailed analyses based on risk factors affecting SCM networks. This indicates that the need for a greater focus on risks in global supply chains is needed. Risk assessments, risk analyses,

andriskmanagementareareasofinterestinfinanceandinsurance.However,thevalueof inventories in global supply chains and the impact of disruptions in global supply chains must be paid great attention. Thisstudyisnotdevoidoflimitations.Therearethreemainlimitationsofthis paper. Firstly, the use of a single comprehensive, multidisciplinary database with a selection of only a few keywords; an article was likely unexplored if it did not contain the word "risk" in the title, keyword, or abstract. Secondly, we reviewed only international journal articles while excluding conference papers, master's and doctoral dissertations, textbooks, book chapters, unpublished articles, and notes. Thirdly, this study's goal was to present and categorizerecentSCRMresearchandexplorepotentialresearchgaps.Nevertheless,using this paper's categorization and summary results, further research can be conducted into specific underexplored or unexplored areas. This literature review is expected to benefit researchers to further explore studies in SCRM so that supply chain risks can be managed more effectively and efficiently.

CHAPTER 7

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World Journal of Social Sciences Vol. 8. No. 3. September 2018. Pp.13-27.

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