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Title of Thesis: Supply Chain Risk Management Of Tata Motors

Date: 17 August 2022

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Supply Chain Risk Management of Tata Motors.

Abstract

The name of this research study is the supply chain risk management of Tata Motors. In the business, the importance of supply chain risk management is elevated because of its importance. The company which has been selected for this particular research paper the Tata Motors is a renowned multinational automotive company in India. One unique thing about this company is that it has launched the first spot car in India. For this reason, this particular company has gained fame in all across the world. In order to evaluate the significant risks that are associated with a particular organization, the role of supply chain risks management is far above the ground. Furthermore, the supply chain risk management also makes sure the production and deliveries are performing optimally. Supply Chain Risk Management is the recognition, evaluation, and supervising of risk intermediaries, plus the organized approaches to decrease susceptibility and make certain permanence of service and abundance of production. A superior supply chain risk management starts with a recognition and estimation of the entire risk intermediaries, both those that are convenient and those that are not. Formerly the risks are itemized, and enumerating those risks is the subsequent step. A particular company needs to appreciate their brunt and settle on the proper amount of endeavor on the basis of the prospect of incidence and significance. Apart from this, some of the benefits of supply chain risk management are diminishing the legal responsibility of the trade, resolving the issues that are related to the specific organization and so on.

The risk management of the supply chain has created a significant impact on the business of Tata Motors. Here in this paper, the researcher has employed the deductive approach in order to foster the research paper in an effective manner. On the other hand, pragmatism philosophy has been selected by the researcher for this paper's particular research study, which is the supply chain risk management of Tata Motors. Apart from this, for collecting the obligatory data, the researcher has considered both the primary and the secondary sources. On the other hand, in the secondary sources, the researcher has collected information from several journals, articles, websites, newspapers, etc. In order to gather the data from the primary sources, the researcher here has conducted a survey. On the other hand, in the discussion of the chapter on the findings, the supply chain risk management is determined as the fundamental approach for analyzing the risks of the specific association and in order to take steps to ease the risks that are interrelated with the particular firms. Apart from this, to perk up the trade's cash flow, the significance of the supply chain risk management is elevated. On the other hand, in trade, some of the risks that are associated with the supply chains are the alternation that takes place politically, instability of the financial system, risks correlated with the ecology, cyber-attacks and many more. Apart from this, here in this paper, the researcher has set four objectives and a research question to conduct the research in a systematic way.

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Chapter 1: Introduction

1.1 Research Background

The supply chain risk management is considered as process based on identifying, mitigating and assessing risks of the supply chain of organization. The aspect of implementing global risk management strategies of supply chain can assist the business enterprise in operating efficiently along with reducing costs as well as enhances the service of customers (Pournader, Kach and Talluri, 2020). The Supply Chain Risk Management (SCRM) is majorly focused on taking certain strategic steps for the purpose of identification, assessment, as well as mitigation of the risks from the end to-end supply chain. It can be said that supply chain management is referee to aspect of how the business organization manage desired flow of goods which involves all type of processes that are involved in order to transform the raw materials which a business company consumes into the finished services to products that are offered by the respective firm.

With the assistance of a proper and efficient supply chain risk management strategy, all types of risks might be managed in a comprehensive approach. The occurrence of risks in a supply chain can occur at any point in time. This includes managing as well as planning sourcing, procurement, conversion as well as functions of logistics management. One of the major reason which the companies implement global strategies of supply chain management is based on boosting competitive advantage (Javaid and Siddiqui, 2018). It is considered that whenever the organization expands its business on a global basis, such challenges are faced in the supply chain. It has been observed that supply chains are mainly exposed to international as well as supply chain risks. This risk management strategy of supply chain is said to be helpful to the organizations when it is essential to the success in events like unpaid bills, natural disasters, disruption of transport etc.

The purpose of the supply chain risk management is associated with the aspect of preventing several issues along with provide a loss mitigation if several risk events may occur. It can also be said that with growing prospects of network as well as increased global dependencies, there remains high risk if an individual slip from one area and the company can face the risk of losing customers. Moreover, it can also be said that whenever the complexities of the supply chain increase, then the certain chances of disruptions along the supply chain also get increased. It can also be said that whenever the complexities of the supply chain increase, the chances of exposure to the risk of the supply chain also increase (Rostamzadeh et al ., 2018). With the help of supply chain risk management, it can be ensured that production as well as deliveries can function optimally. In addition, the supply chain management strategies also guides the business companies in avoiding loss of profit by detecting several form of risks in the earlier stage as well as safeguarding brand image as well as reputation of corporation.

1.2 Research Rationale

The concept of risk management is concerned about elimination of certain unwanted materials from the supply china along with improving best and effective practices associated with supply chain so that it can be operated in efficient manner. Whenever a business organization wastes its significant resources, it can be regarded as a specific risk for organization. The utilization of supply chain risk management within organization assist and guides the business organization in managing supply chain through eliminating several risks from supply chain (Behzadi et al ., 2018). For eliminating risks from operational supply chain, the strategies of risk management can play a pivotal role. The implementation of the supply chain risk management within the supply chain has various benefits such as ensuring optimal functioning of the production and deliveries, elimination of loss by detecting the risks at an earlier stage, presenting a quick response to the unexpected

events, safeguarding the brand image of the organization, maintaining the customers' satisfaction, and many more. The aspect of early detection of risks through fluid communication is said to be the most significant benefit of this strategy of supply chain management. It is considered that preventing crisis might be done through initiating proper communication. Since the business provides tends to integrate the management and technology software, the visibility as well as communication are enhanced in order to keep all individuals aware of flow of products and materials.

The ability to manage supply chain risk in organization like TATA Motors help the user to reduce complexity of issues along with can prevent challenges altogether. This begins through identifying the specific risks that can prevent the user from getting products customized to the customers on proper time along with understand the factor of how badly each type of risk can hurt operations as well as guides the business forms to find quick and effective solutions to manage situations (Javaid and Siddiqui, 2018). It helps in the promotion of an agile supply chain for better results. Apart from all the advantages that have been discussed so far, the market share of the organization can be boosted up and would be helpful in outperforming the competitors. It can also be said that the supply chain risk management helps in the detection, reduction, and optimization of the exposure of risk so that the cost of the business activities can also be maintained.

1.3 Problem Statement

The expansion of expanding or outsourcing solution of supply chain comes with various risks upon which some are predictable and some are not. It is considered that if a business company is focusing to stay ahead of several potential threats to normal mode associated with operation, the aspect of integrating a solution of risk management can be defined as crucial step. The existence of risks within the activities of supply chain is considered as crucial aspect as it tends to impact

negatively on progression of supply chain. Every business organization can identify slowly the basic importance of the supply chain risk management. Any type of disruption in the supply chain can cause up to millions of losses for the company. The presence of risks can also cause negative impact on brand image and reputation of organization (McMaster et al ., 2020). This particular research paper will be mainly focused upon discussing the risks from the supply chain of Tata Motors. The supply chains leading to the retailers, distributors, and dealers are disrupted as a result of which the delivery of products gets failed due to the poor service and retailer capacity. Therefore by the adoption of effective strategies of supply chain risk management, the main goal of the organization can be achieved.

1.4 Research Aims and Objectives

The aim of the research paper is to analyze the concept of supply chain risk management for Tata motors. Based on the aim of the paper, the following objectives have been framed for the paper:

- To analyze the role of supply chain risk management in the reduction of wastes from the supply chain of Tata Motors
- To study the various advantageous aspects of supply chain risk management
- To determine the various sensitive parameters of supply chain operations responsible for risk management
- To demonstrate the role of supply chain risk management in enhancing the financial performance of organizational operations of TATA Motors

1.5 Research Question

The research question is considered as specific inquiry which the study of research seeks to provide a definite response so as to provide a clear idea about the study to the reader. The aspect of selecting

a research question is considered as essential element of both qualitative and quantitative research. Based on the main objectives of the research paper, a necessary research question can be framed

1. What is the significance of supply chain risk management in enhancing the productivity and profitability of TATA motors?

1.6. Research Scope

The supply chain of a company encompasses entire process associated with acquiring raw materials, making products as well as selling of goods across all essential stages of the lifecycle of product that includes distribution and manufacturing process. There is a wide scope of this particular paper as this research study determines the role of supply chain management in enhancing productivity as well as profitability of TATA Motors. Both virtual and physical goods are considered as vital part of supply chain and order management process and systems that are necessary for servicing products which are sold and created. The potential risks which threaten a supply chain involve natural disasters, lack of raw materials, outburst of pandemic, logistical errors and late shipments (Pournader, Kach and Talluri, 2020). The specific key to maintain a strong level of supply chain is based on creating effective management of supply chain system for mitigating any inherent risks at play. The system of supply chain management is considered as the specific process based on overseeing as well as organizing supply chain operations of company. Every step in supply chain, from the procurement to the inventory management to distributors needs to be accounted for as well as monitored appropriately. The enterprise resource planning must includes a specific thorough accounting of entire supply chain within business organization. The process of supply chain management is referred as complicated endeavor with various types of moving pieces along with possessing centralized source of the information that may help in keeping efforts accessible and organized. One of the beneficial scopes of supply chain

management is increased security. Increased security as well as safety is regarded as the clearest benefit which monitors supply chain so that it can catch vulnerabilities before they become threats as well as react quickly when issues occur. The supply chain risk management can be considered as instrumental for creating positive experience for clients and customers along with help them in acquisition of new type of business (Munir et al ., 2020). The supply chain risk management can streamline processes of business as well as guides in providing certain reliable services. This system can also save huge time as well as money thereby allowing cash flow for being relocated towards future goals of company. With the help of this study, the readers can get a detail understanding of the working of supply chain management and how this system can initiate profit This research study is focused on analyzing the performance of supply chain risk management system in one of the top automobile organization of India called TATA Motors.

1.7 Research Structure

This particular section of this research paper delivers the main structure for the work that can be very effective for delivering the certain idea to run or process paper. It is basically the outline of the paper which provides research structure towards end of introduction chapter. It is one of the one of the important part of the study that tends to provide a specific overview of each and every chapter of the research work. For conducting research study, it is essential for researcher in maintaining a proper structure of research that underlines mostly all chapters which are taken into consideration for accomplishing research study. The main components of the research structure are as follows

Chapter 1 (Introduction): It deals with introduction of research work. This introduces topic of research which must be chosen by research individual. The research individual formed an aim which focused on generating estimated result from collected data. This section brings up certain

objectives which are created on the basis of aims and objectives and is also focused for serving as remedial measures for challenges that are faced while carrying out research.

Chapter 2 (*Literature Review*): This section mainly deals with the opinions as well as viewpoints of several other authors who have carried out the research work by considering similar topic. In this section, the research individual evaluated all the main objectives that have been pointed out in the research paper and tries to analyze the topic in a more detailed way.

Chapter 3 (*Research Methodology*): This deal with selecting appropriate and effective methodologies to carry out the research work in effective manner. The research individual provides a specific structure to findings. The methods and their sources of collecting relevant information are described in detail.

Chapter 4: (*Data Analysis and Findings*): In the fourth chapter of the paper which is data analysis and findings; the main focus of study is to analyze the collected information in a suitable way.

Chapter 5: (*Discussion*): This fifth section of the research paper offers comprehensive conversation on the desired results and findings obtained from analysis chapter.

Chapter 6 (*Conclusion and Recommendation*): The final and last chapter is the conclusion chapter which presents the overall summary of paper and also provides some recommendations for future.

Chapter 2: Literature Review

2.1 Overview

Automobile manufacture is found to have a complex level of value chain and has a requirement of broader range of materials that are manmade which is primarily found to include materials that are composite at a high refined scale. TATA motors have undergone conduction an assessment base on natural capital for the identification of impact and dependency in the operations of the manufacturing units respectively. The elaborated literature review will help in understanding the importance of the supply chain risk management along with the challenges involved in the supply chain risk management process of TATA Motors. This literature review will aim to meet the aim of the study which is to analyze the concept of supply chain risk management with respect to Tata Motors.

2.2 Theoretical Framework

2.2.1 Evolution of Supply Chain Risk Management

There have been various roles in increasing terms that leading to devote the risk management. It has become a responsibility in formal terms about the risk management of the supply chain material that are existing and roles of operational management. This particular stem tends to rise with the risk of supply chain visibility. The increment in the capability of information technology has lead to the demonstration of management of business along with the available rewards by means of practice of improvisation of risk management (Elet *al.* 2021). In the time of challenging aspect of the economic times management of risk can be a helping hand of a particular organisation in enduring and get beneficial note from the risk aspect at the competitor expense which is no profound in management of risk respectively. The visibility in the aspect of management of risk

leads to the rising and failure with every report of prevailing disasters. The ongoing roles and responsibilities in the formal terms can lead to help in countering the level of rise and fall with every report of attention that is devoted to management of risk whenever there is an occurrence of risk (McMaster *et al.* 2020).

2.2.2 SCM Related Risks Factors Faced by Tata Motors

According to Junaidi (2020), organizational sustainability necessitates bottom-line initiatives that balance responsibility to society and environmental consequences while attempting to maintain commercial feasibility. Sustainable supply chain risk management is already becoming progressively complex and dynamic to supply chain globalisation, market uncertainty, and social pressure. In a broad sense, SSCRM is a useful approach for enhancing, trying to implement, and trying to assess inventory control strategies to assist management in managing and controlling the risk of Tata Motors. CRM has now become a strategic requirement for corporates, according to. Unlike conventional SCM, which also concentrates on institutional firm growth, supply chain management (SCM) is an amalgamation of protection of the environment, social and industrial progress objectives. Supply chain highly efficient supply risks and costs are reduced by initiatives including commodity rehabilitation, organisational customer engagement, and financially viable input materials references. As little more than a result, improving risk factor monitoring and assessing objective indicators in the distribution network are critical for identifying and managing associated risks. The risks can be managed to obtain from the green procurement and next measurements recognised because there are secondary signifiers following every level is one (Junaidi, 2020). This paper aims to assess potential risk eligibility requirements and calculates the muscle mass for every potential cause. As they can see, there seem to be numerous risk considerations in this. If they use the conventional formula to calculate the poundage, the

percentage of comparative combinations is greater, which tends to result in the reliability of judgement result obtained not very expensive. This paper aims to assess these potential risk criteria and calculates the mass of each risk factor utilising Tata Motors.

More particularly, the Tata Motor's foreign businesses present a multitude of issues and uncertainties, which would include, but are just not severely constrained to, communication problems, ethnic barriers, troubles in staffing and having to manage foreign subsidiaries, underlying obstacles and delays in legal certainty and deferred revenue gathering under international judicial systems, the reasons for non-barriers, financial and supervisory prerequisites influencing the Firm's capacity to penetrate emerging industries. According to Junaidi (2020),urrent taxation dictatorships (which would include regulation and threatening to withhold as well as other taxation on transfer payments and other reimbursements from subsidiary companies), overseas investment constraints Foreign currency exchange helps to control and limitations on help finance voluntary return, numerous different import restrictions trading activities or investor punitive measures, and compliance costs.

Risk types	Effects of risks	Mitigation
Economic risk	Problems faced by the Tata motors after spending extra financial strength on products and materials for the cost with up down in the economy around the world.	Making a proper financial structure and having a management in the company.
Environmental risk	Different environmental problems faced by the motor's factories related to pollution and so on in the areas.	Proper pollution and sewage water management is required to be obtained. The factories are required to be built in the outskirts of the state.

Supply operational risk	Different risks related to distribution and logistics.	Having proper Human resource manager or using proper software like CRM to maintain the work.
Social risk	There are different types of problems due to which an environment of the Tata motors can be in trouble like not having proper work ethics and problems with the labors and so.	There are ways like understanding the problem and having a proper feedback system can help Tata motors. Understanding the labors will also help and will help in the blooming of the company ethics wise.

Table.1: Effects and Mitigation Strategy for the Risks in SCM

(Souce; By the Author)

2.2.3 Challenges Faced While the Managing the Aspects of Supply Chain Management

2.2.3.1 Material Scarcity

Insufficiency in terms of inputs has been a major concern with the advent of pandemic. The suppliers and the companies in the present times are found to be on high struggle note for meeting the demands in the middle of the availability of the parts and material that are found to be limited. In the time of scarcity in inputs the ability of the brand in sustaining show higher scale of dependence in working capital for weathering the downtime and ramping up the hours of peak season respectively (Mukherjee,2022).

2.2.3.2 Increment in the Prices of Freight

In contrast to the expectation in the initial terms the requirement of shipping in container has showed higher scale of improvement in considerable terms in the pandemic time. With the increment in the lockdown measures on worldwide note has lead to show significant hike in the e-

commerce sales. The response as a result of the e-commerce sales has shown greater aspect of demands for import of the raw material and consumer goods that are manufactured. This demand in particular was found to show higher substantial rate than that of anticipation, it came across the insufficiency in the capacity of shipping and a significant level of shortage in available containers. This scarcity has eventually leads to the increment in prices with a jump of 240% extending from China to West Coast (Baryannis *et al.* 2019).

2.2.3.3 Difficulty in Demand Forecasting

In the mid of the Corona pandemic, Demand Forecasting is found to introduce a complete new layer of complexities in the supply chain management of various companies. Covid Pandemic has lead to the shattering of the forecasting aspect for the respective suppliers and retailers of goods and service of the consumer keeping them in dark about the amount of inventory needed for stocking and manufacturing at a particular period of time. The challenge has risen from the trying aspect to improvement in predictions for the demand in consumer. The managers of the supply chain in the present situation can lead to show encouragement for abandoning the biasness and pursuing a whole new set for various forecast models and undergo a continue mode of refining the results for increasing the accuracy level respectively (Mouloudiet *al.* 2022).

2.2.3.4 Change in Consumer Attitudes

Pandemic has lead to bring a significant change in the behaviour and attitude of the consumer respectively. Pandemic has lead to lower the threshold level of the delivery times and have also lead to raise the requirement with respect to consumer experience on positive terms. The challenge leads to bring in supply chain with the characteristics of agility that has the harnessing capability of automation for optimising fulfilment and create space for handling increasing demands with greater sense of ease (Behzadiet *al.* 2018).

2.2.3.5 Digital Transformation

When there is a discussion on the operations of the supply chain IoT and digital transformation can be considered to be double blessing. There have been various technologies that have the equal or more potent in enhancing the way of approaching the traditional type of supply chain. It leads to the inclusion of drone, robots, artificial intelligence (AI) and electric vehicles respectively. However all the mentioned technologies have the similar aim of increasing the efficiency and cost effective in the long term. Implementation of various technologies in all the supply chain of the company in a country has a greater scale of challenging aspect.

2.2.3.6 Strategies of Supply Chain Risk Management

Mitigation of the risk involved in supply chain can be a difficult task as a result of cyber interference and internationalisation. In that context, there have been various measures in terms of strategies that can lead to the reduction of exposure to risk of respective businesses.

2.2.3.7 Leveraging the Model of PPRR Risk Management

The PPRR risk management model is considered to be a popularised strategy of global supply chain risk management which is applied by various businesses on a greater scale across the globe. The “PPRR” is found to be standing for prevention which involves measures of precaution for the mitigation of supply chain risk. Next is preparedness which involves development and implementation of contingency plan in course of emergency. The R of PPRR stands for response which involves execution of the contingency plan for reducing the impact of the plan leading to disruption. The last R stands for resumption of operations and getting things run at a significant capacity in the quickest pace respectively (Raghunath *et al.* 2018).

2.2.3.8 Management of the Environmental Risk in the Supply Chain

This has led to greater importance that pandemic has led to the exposure of gaps in the global retail aspect and supply chain manufacture that lead to increase the proneness to disturbance. Various retailers were bound in re- evaluating their relationship with the respective vendors as most of the suppliers were found to be sourced from China, the epicentre of the pandemic outbreak. With a significant reduction in workforce retailers are found to be struggling in processing and getting shipments on time period. Retailers are found to show transition from the single – source to multi- source model which eventually help in providing a contingency plan where the primer supplier become is under unavailability. Various businesses are found to bring changes in their business model on a entire note for adapting the changes that are faced on drastic sense in the viability and seasonality of the products respectively. There have been various strategies that are been used by TATA for the improvisation of resiliency of the supply chain respectively (Rafi-Ul-Shanet *al.* 2018).

➤ Multisource

Multi source refers to the multiple aspects that can be present around the whole state of problem and issues. Categorisation of the suppliers is an efficient way of mitigating the risk however not only by being limited to expenditures but also the potential impact should be taken care of. It is important to have a detailed searching of the extra suppliers with which there is an increasing potential of doing business. It is also efficient in working with suppliers that leads to the production from various locations respectively.

➤ Nearshore

There is a need of finding distributors and suppliers that are close to the operating centre of the business or the end point of the supply chain can also be taken into count for reducing the times of

cycle needed for the development and delivery process of product. The regional suppliers can be found to become more on the expensive end however reducing the travel time can significantly bring reduction in risk associated with the supply chain management (Prakash *et al.* 2018).

➤ **Taking Stress Test on Frequent Basis**

The prime step included in the test is mapping the network of the supply chain. Reoccurring and comprehensive stress tests are considered to be the most efficient way of checking the vulnerabilities as a major part of them are found to be latent in the supply chain (Abdel-Basset *et al.* 2020).

➤ **Establishment of Buffers for the Purpose of Capacity and Inventory**

This is considered to be an additional expense however a bit of smart planning can make it worthy. New launches of product and relative expansion in a defined new space can lead to create perfect time for the creation of buffer capacity. For the reduction of risk in association with climate and environmental aspects, stockpiling of the products has the involvement of high risk in the hurricane season (Fan *et al.* 2018).

➤ **Investment in Products and Harmonisation Of Plants**

Utilisation of the technology that is identical for various components are found to be allowing greater scale of flexibility in the time of disruption. Utilisation of one similar scale of software in the networking process with the special mention to the architecture based on cloud can lead to the reduction in the inefficiency level of the data that is siloed. It also helps to efficient communication among the system (Fan *et al.* 2018).

➤ **Improvisation of the Supply Chain Risk Management**

In case of various businesses, the internet of things (IOT) and various other latest technologies are found to be playing a major role in optimisation of operations of the supply chain. However they

are found to be leaving their respective businesses in the face of threat associated to cyber security mainly concerning the ransomware, phishing, hacking etc. The risk associated to the environmental aspect can be found to act as additives to the respective vulnerabilities. Establishment of the standards of compliance for the respective third party vendors involving the manufacturers, distributors and suppliers can lead to strengthen the defences associated with the cybersecurity (Ivanov, 2018).

➤ **Importance of Supply Chain Risk Management**

Risk management leads to the stimulation of various practices of supply chain. Management of risk is an integral factor leading to the elimination of waste. Utilisation of resources in an unnecessary manner leads to the creation of unnecessary burden as each asset being deployed, whether completely utilised or not leads to the requirement of one particular protection of risk. This particular kind of waste may lead to the increment of complexity and the additional risk of the consequences that are unintentional. Risk management on a general note leads to the improvisation of the partner relationships of the supply chain with respect of improvement in the sharing of information. There is an increment in trust with the risk management practices as it leads to the demonstration of commitment with the ability of the supply chain that can be counted on. The risks that are difficult for measurement are often not addressed without the process of the management of risk. Maintaining constancy in vigilance and awareness in the process of making decisions, goals and practices that are found to be increasing or decreasing supply chain risk in an unintentional manner is a difficult task bearing the characteristics of non-intuition however it is well maintained and handled as a result of roles of risk management.

Every business is found to be handling the strategic balance of the reward and risk. On the course of the time, to earn a big reward on a general basis leads to the requirement to endure a greater scale of risk. Management of risk leads to exposure to risk in an optimal minimal level however the organisation is found to be seeking the greater scale reward from the capabilities, assets, resources and people respectively (Gao *et al.* 2020).

2.2.4 Competitive Advantage by Means of Risk Management

Risk management leads to the delivery of the competitive advantage on a strategic note to the respective organisation which leads to allow them for gaining market share from the aspect of competitors that are under poor development when there is a strike of common risk. Additionally risk management leads to the improvisation in the aspect of prevention, discovery and addressing of the smaller aspect of risk that leads to the costing of the efforts, time and expense of entire organisation. The beneficial counts are found to be increasing in case of practice terms all over the supply chain. A supply chain risk management under practice is found to be quick in spotting risk and in responding. It is found to be fast in claiming advantages from the respect capabilities. The supply chain in terms of competitors and the risk management practices of the organisation might be failing from well development. This has leads to become a subject to competitive advantage even in the count of produces of commodity product (Garg, 2019).

2.2.5 Supply Chain Management of TATA Motors

Supply chain management is considered to be the systematic process of designing, planning, executing, controlling and monitoring of all the activities associated with the supply chain with the conclusive objective of creation of net values, establishment of competitive structure that is competitive in nature, leveraging of the logistics on worldwide note, establishing a synchronisation of the demand with the respective aspect of supply and measurement of

performance on a global note (Arora *et al.* 2019). The automobile industry is considered to be one of the strong pillars with respect to the global scale of economy and is considered to be the one who is driving the change of growth on macro-economic terms. It is also considered to be the main driver for bringing advancement in terms of technology and stability respective in the countries that are developed and developing respectively. It is found to span various other industries on adjacent terms. The products of the Tata Motors undergo selling and buying process by a network which comprises of dealers that are authorised and various centres of servicing in the domestic market. It also comprises of the networking system comprising of the distributors and the respective local dealers in the global market respectively. The company is found to be monitoring the performance scale of the respective distributors and dealers (Craighead *et al.* 2020). The company is also found to be providing additional support for enabling them to perform at the needed expectation. On account of any underperformance found by the dealers or distribution can eventually lead to adversely affect the sales and operating counts of the Tata motors in a significant manner respectively. The company is found to be relying on the respective third parties for the supplying of the needed raw materials, components or the parts required for the manufacturing of the products. However the company is found to show dependence on the particular source in order to get some of a particular part or components respectively (Yanget *et al.* 2018). The ability of the Tata Motors in procuring the supplies in a process that embarks cost effectiveness and times aspect is found to be a subject to various kind of factors out of which a major part of them remains out of control (Ali *et al.* 2019). The company is found to be managing its respective supply chain as an integral part of the vendor management process. Any issues in association with the supply chain can be found to affect the operating level of the company on a significant note respectively. The adverse impact of the accidents that are primarily man made, natural disasters, harsh economic

conditions, declination in the demand of the automobile, lack of accessibility to the significant arrangement in terms of finance could eventually lead to put negative impact on finance on the distributor and suppliers of the company respectively which eventually in turn leads to impair the time basis availability of the respective components which in turn leads to the increment in the component prices. In the time of the management of the supply chain that are complex the company is found to undergo developmental process of close relationship with the supplies in the direct and indirect manner. the company is found to be continuing the development of strategic relationship on longer term basis with the suppliers for supporting and enhancing the parts development and bearing facilities with the aspect of production and technology respectively (Bier *et al.* 2020).

2.2.6 Mitigation of the Supply Chain Risk of TATA Motors

With the rapid advancement in the aspect of paradigm in the aspect of the marketplace relative to automobile primarily involving autonomous and electrification aspect of the car. Tata motor is found to show continuity in terms of investment in a substantial manner in Research and Development. The company is also found to show continuity in the focus with the strategic aspect on the respective key areas of technology involving autonomy, electrification and connectivity respectively. It has the aim to launch such products that keep them a step ahead of their competitors. They are preceding their work in the development of electric vehicles that are found to show high performance. The company is found to make investment in difference programmes of development for the reduction of the consumption of fuel by the utilisation of materials that are predominantly light weighted, reduction in the parasitic losses by means of driveline. It is taking multiple steps to show improvement in aerodynamics (Gouda *et al.* 2018).

Technology is counted as a significant factor leading to show transformation which in turn leads to the addition of extra potential features to the respective products which leads to ensure better quality, performance, safety and efficiency of the ride and performance respectively. Tata Motors is found to continuity in the investment process of technology as it is considered to be an effective solution leading to bring substantial changes in the market with the aspect of automation in the respective factory lines and show transition from the manual scale to electric scale (Sentiaet *al.* 2020). This eventually help us in focusing on product launching having the characterisation of being industry defined which eventually help Tata motors in staying ahead of their respective competitors. It also helps to strengthen the partnership aspect in association with the technological organisation on global scale. It is also found to lead the academic research team in a significant note (Elet *al.* 202).

2.2.7 Evolution of the Customer Demands

The preference of the customer with special reference to the mature market is found to show greater scale of trending mainly in smaller cars with greater fuel efficiency and vehicles that are on environment friendly note. In various markets these particular customer preferences are found to be driven by the environmental concerns of the customers or show increment in the prices of the fuel (Shaikhet *al.* 2021). Tata motor is found to show development various newer versions and models of the vehicles in different segments bearing various capabilities respectively. Tata Motor is found to show development and launch of the first bio-methane engine in India for the respective buses. Advancement by means of technology and innovation services and the portfolios of the product and services can lead to the development on the basis of the change in the customer demands respectively (Lückeret *al.* 2019).

2.2.8 Competitive Business Efficiency

The company has showed initiation in terms of programmes that leads to the optimisation of the efficiency level with respect to the operation. However,an underlying risk prevails regarding the fact that the initiated programmes might fail in delivering the targeted efficiencies and the benefits that are anticipated might not be fruitful as per the expectations. In case of the inability of the company in delivering the expected benefits from these particular programmes it then might impact the business on adverse terms. The ability to make successful completion can also be found to be majorly affected on the long run respectively (Muniret *al.* 2020).

Tata Motors is found to launch various initiatives for the reduction of complexity in business and product and to increase the beneficial counts from the aspect of scales of economy. There is a development of robust process of project management for ensuring the targets that are set are fulfilled. Tata motors are found to put forward various initiatives like impACT(Improvement by action) projects on the basis of business and objective challenges of Business Score Care (BSC). The impACT projects are found to be constituting various projects that are systematic and helps to address various key processes which happened to be the backbone respectively. Tata Motor is found to be developing a tool that is based on real time analytical data for aiding the decision making process of the business and for realising greater scale of efficiency. Additionally the plans of expansions are found to be presenting opportunities for investing in the facilities that are characterised world class and in the enhancement of the capabilities respectively (Pournaderet *al.* 2020).

2.2.9 Uncertainty of Diesel

Adversity found in the perception of public and the driving nature of the policy of government and media regarding vehicles that are powered by diesel has lead to the precipitation of the fall in the

sales of the diesel majorly found to be in Europe and UK respectively. It has also lead to the creation of uncertainty among the customers which can be found to majorly impact the sales of the future on a significant note. Additionally the impact of negative sales with respect to finance can lead to the creation of challenge in the achievement of Co2 compliance. The fall in the sales of diesel is found to be causing disruption on a higher note to our respective supply base (Agrawal *et al.* 2018).

Tata Motor has shown commitment in terms of expansion and introduction of the electrified fleet in the portfolio of the product along with the continuity in case of refinement of the respective internal based combustion engines and flexibility in the production in the respective manufacturing centre for the engine of Tata motors (Xuet *al.* 2020).

Expansion of the electrified fleet will be enabling Tata motors in terms of growing their reach in the field of hybrid spaces and electric vehicles. This results in easy recovery of the investment that is been made on complete battery operated EVs primarily involving I-pace (Boikoet *al.* 2019).

2.2.10 Comparison between Tata Motors and Ford Motors over the Risks Faced by the SCM

The strategy related to existing production networks of organisations has the potential to reduce the risk, while the strategic approach necessitates the implementation of entirely new production networks by organisations has an increased likelihood. Thus, adoption rate methodologies have the lowest risk of successful execution, whereas wealth creation has the highest risk of successful execution. If folks examine the approaches of Ford Motor Company and Tata Motors and outline them with a Balanced scorecard, researchers can reach the conclusion that Ford Motor Company is employing low-risk methodologies while paying the lowest valuation for them, so even though Tata Motors is employing high-risk approaches and is thus in an end up making situation. To

support this inference, people address the following analysis: Ford Motor Company has experimentally demonstrated important competitive benefits in the production of adjustable assembly plants with mass customization that have worked extensively and excellently (Sentiaet *al.*, 2020). They created a globally centralised supply chain network that efficiently and successfully endorsed their primary comparative advantage. The contemporary global recession has definitely had an impact on their revenues, and the higher supply chain costs are negatively affecting them. However, their relatively safe strategic approach of directly attacking international opportunities for existing products or services has kept their venture capitalists interested despite their poor financial performance. Furthermore, they have managed to sell off non-performing resources such as Jaguar as well as Land Rover to lighten the stress of overhead expenses. Because they are confident in their reduced techniques, they had already continued to refuse government handouts and anticipate to separate even by 2020.

Tata Motors is attempting to implement slightly elevated methodologies because they have tried to invade two major markets in something they have neither any expertise – the UK and European major automobile marketplaces with the assistance of Jaguar and Land Rover, and the \$2500 Nano car, which may collectively develop the proposed automobile market internationally. If situations go their way, they have always had the possibility of becoming the next Ford of both the universe, but if things go wrong (as in the Symmetric-key algorithm emergency), they could lose money that would continue indefinitely to recover from.

2.2.11 Compliances and Environmental Regulation

Tata motors is found to be operating in an environment having the characteristics of drastically changing landscape with particulars to the issues relative to environment specific to fuel economy and emissions. This will be found to put a major impact on the respective products of Tata along

with facilities associated with manufacture. However, the drastically changing landscape can lead to bring additional challenging aspect in adapting innovations and technologies relative to manufacturing, validation and testing of the respective new standards (Farmania *et al.* 2021).

Tata motors have worked on a successful note towards achieving the aim of cleaner manufacturer and vehicles with increased efficiency by the application of standard and modern technology. Tata motors was found to showcase their brand new version of electric car EVision in the event of Geneva International Motor Show of March 2018 (Srivastava *et al.* 2021). The EVision car has showed the utilisation of OMEGA architecture. It was developed while collaborating with JLR. The developing process of electric products based on battery and the development of plug in hybrid technologies has helped in achieving the compliance in alignment with the products that are found to show satisfaction of the customer demands. Tata Motors is the first in the development process of first bio methane engine for the respective buses in the present year (Xue *et al.* 2020).

2.2.12 Cyber Security and Information

The latest and advanced technologies generally lead to the introduction of the threats that are unprecedented to the respective devices that have internet connectivity. In the recent times, the hacking incidents on the global prospects has lead to impact the environment on geo-political aspect and has indicated the increment in the level of motivation for instigating the cyber attacks respectively. Any loss in the data relative to personal and sensitive aspect or any incidents of breaching in various safeguards can result in legal reaction on significant note in combination with the imposing of the fines and associated regulations (Lam *et al.* 2021).

Tata motors is striving for implementing consistency in the policies and procedures of security in the time of providing education to the restive vendor, staff and suppliers for embedding

significant practices. The companies are found to be doing by the implementation of the internal tools for the detection and mitigation of the emerging and the latest threats associated with cyber security(Xuet *al.* 2020).

Tata motors are found to striving for maintaining a potential and stronger level of environment that is IT controlled. In order to monitor and respond to the latest and threats associated cyber security. Tata motors are found to put its entire focus on in depth and greater sense of intelligence scale in the controls over the time being (Sarjana*et al.* 2020).

2.2.13 Warranties and Liabilities of the Product

Tata Motors is found to be exposed to the cost and risk in association with the liability of the product. Warranties and recalls in association with the compliance, performance and safety related issues that are found to affect the products (Xuet *al.* 2020).

Tata motor is found to monitor the service data on regular level of the respective vehicle for managing the recalls in a proactive manner and minimising the claims that is associated with warranty. The companies are also found to ask for updates relative to technical aspects to the respective dealer networks for managing defects and faults that have been identified (Xuet *al.* 2020)..

Enhancement in the connectivity of the electrical vehicle along with capability on digital terms lead to provide numerous opportunities to Tata Motors in the identification and finding remedy of the potent faults in a more efficient manner. In the Indian context Tata motors is found to show alignment with the vision that is set by the government of India and is making every single possibility in bringing the updated technology in the supply chain but eye at the risk and the process

that can lead to significant mitigation in the management process of the supply chain respectively (DuHadway *et al.* 2019).

2.3 Summary

Automobile manufacture is found to have a complex level of value chain and has a requirement of broader range of materials that are manmade which is primarily found to include materials that are composite at a high refined scale. It also includes natural resources majorly including water, sand grid power and fossil fuel respectively (Garg,2019). The entire chapter has made an elaborated discussion on the importance of the supply chain risk management. It also includes the conceptualisation of the supply chain risk management along with various challenging aspect that are faced during the time of managing supply chain risk. The chapter has also included various strategies that leads to the mitigation of the risk involved in supply chain management.

Chapter 3: Research Methodology

3.1 Overview

The particular chapter of research methodology can specifically be considered the third and one of the most significant chapters of the whole dissertation. With the help of the research methodology chapter, it is possible for the research papers to answer all the research questions in an efficient way. It can be considered the key responsibility of the research paper to select and identify the ideal and appropriate research techniques in order to achieve the desired and effective result. The entire chapter on research methodology can be considered very effective in the process of guiding the researchers on the effective ways to execute the whole research paper. With the specific approach of selecting the ideal and appropriate research methods, the research papers are capable of developing and maintaining the quality and effectiveness of the entire study (Newman and Gough, 2020). There are some major sections in the chapter on research methodologies such as research philosophy, research approach, research strategy, data collection method, data analysis technique, research ethics, and research limitation.

3.2 Research Philosophy

The particular section of research philosophy can be considered one of the most vital sections of the research methodology chapter. The chapter on research philosophy is very popular for helping the research scholar to gain a clear concept about the selected research topic. In order to achieve a desired and successful outcome, it can be considered very significant for scholars to select the appropriate and ideal research philosophy. On the other hand, it can also be stated that it is impossible for the research papers to obtain an efficient result without the process of selecting the ideal research philosophy according to the research topic. There are specifically four different kinds of research philosophies such as positivism, pragmatism, realism, and interpretivism

(Dźwigoł and Dźwigoł-Barosz, 2018). These four kinds of research philosophies are widely utilized in most research papers in order to obtain the desired result. Interpretivism research philosophy is specifically based on the specific principle that the researchers perform a particular role in the process of observing the social world. According to this particular research philosophy, the research is specifically dependent and associated with the interests of the researchers. On the other hand, realism research philosophy specifically relies on the particular concept of autonomy of reality from the mind of humans. This particular philosophy is specifically associated with the assumption of a scientific and practical approach to the process of knowledge development (Bairagi and Munot, 2019). Pragmatism research philosophy can specifically be considered very effective in helping the research scholar to develop the theory in dynamic and innovative ways in order to identify the solutions to the research questions.

In the case of this particular research study, positivism research philosophy has typically been selected in order to achieve a fruitful outcome. The positivism research approach can also be considered very effective in motivating the researchers to execute the study according to their own way. The particular approach of selecting positivism research philosophy can also be very effective in helping the research scholar to enhance their entire knowledge of the particular selected research topic (Newman and Gough, 2020). In the case of this particular research paper, the positivism research approach can specifically be considered very effective in analyzing the significance of risk management in the supply chain. On the other hand, the epistemological approach has also been taken into consideration in order to achieve a more beneficial outcome by executing the entire study in a more organized manner.

3.3 Research Approach

The particular section of the research approach can specifically be considered another vital action of the whole research methodology chapter. It is very important for all research scholars to efficiently and sincerely select the ideal and appropriate research approach in order to achieve the desired research outcome in a systematic way. The particular approach of selecting the right research approach could help the research scholars to guide an organized way to execute the entire research. There are specifically three different kinds of research approaches such as inductive research approach, deductive research approach, and abductive research approach. The particular approach of considering inductive research approach starts with the process of gathering information that is specifically related to the selected research topic (Snyder, 2019). Such kind of research approach can specifically be considered very effective in allowing flexibility and also supports the concept of generating new innovative theories. On the other hand, in the case of the deductive research approach, the main focus here is to offer or provide some specific advantages to the research papers. This specific approach can also be considered very effective and beneficial in order to identify and analyzing the research findings in an efficient way (Zangirolami-Raimundo, Echeimberg and Leone, 2018). Besides all, the abductive research approach can generally be considered a mixture of deductive research approach and inductive research approach. In the case of this particular research paper, a deductive research approach has specifically been selected in order to establish an efficient and fruitful hypothesis on the topic of supply chain risk management. The particular approach of selecting the deductive research approach can specifically be considered very effective in the process of making innovative and authentic theories by executing the entire research paper in an organized and efficient way (Dźwigoł and Dźwigoł-Barosz, 2018).

3.4 Research Strategy

The particular chapter on research strategy can generally be considered one of the most effective and useful chapters in the whole research methodology chapter. This particular chapter can be considered very effective in playing a vital role in executing the entire study in an ideal and appropriate way. Due to this specific reason, it is a very important and significant process to select the ideal research strategy in order to obtain an efficient and fruitful outcome in an effective way. There are two different kinds of research strategies that are most commonly utilized in most research papers. The two different kinds of research strategies are qualitative research strategy and quantitative research strategy. In the specific case of selecting the approach of qualitative research strategy, the studies are specifically focused on gathering the qualitative data in order to develop authentic, informative, and precise theories with the help of different primary and secondary data sources (Newman and Gough, 2020). On the other hand, in the case of considering quantitative research strategy, the theories are specifically focused on gathering relevant quantitative information with the help of primary and secondary data resources; the particular approach of considering quantitative research approach can generally be considered very effective in the process of developing a more practical and reliable research theory. In the case of this particular research paper, the qualitative research approach has typically been selected in order to develop an effective and authentic hypothesis on the particular topic of supply chain risk management. On the other hand, the specific approach of selecting the qualitative research approach can also be considered very effective in making the whole research paper more precise, informative, and efficient (Bairagi and Munot, 2019). Besides all, the particular action of selecting the qualitative research approach can also be considered very effective and helpful in addressing all the research objectives in an efficient and fruitful way.

3.5 Data Collection Method

The data collection method can specifically be considered the most vital section of the whole research methodology chapter. The particular chapter on data collection can play a vital role in helping the researchers to maintain the quality and effectiveness of the whole paper in an efficient way. It is very important to select the ideal and appropriate data collection method in order to maintain the quality of the research. It is impossible to execute the chapter of research analysis without considering an effective data collection system. On the other hand, an effective data collection method can help the whole research paper to identify the areas that could help the paper to enhance the entire effectiveness and quality (Snyder, 2019). There are specifically two different kinds of data collection methods that are most commonly utilized in most research papers in the process of gathering relevant information associated with the research topic. The two different kinds of data collection methods are primary data collection method and secondary data collection method. In the case of considering primary data collection methods, the papers are specifically focused on collecting relevant information by utilizing multiple live experiences such as surveys and interviews (Zangirolami-Raimundo, Echeimberg and Leone, 2018). This specific process can generally be considered very effective in the process of gathering practical and accurate information that could be very helpful in understanding the current situations associated with the particular selected research topic. On the other hand, in the case of considering secondary data collection methods, the research papers are specifically focused on gathering data by utilizing several existing theories (Dźwigoł and Dźwigoł-Barosz, 2018). This specific research approach can be very effective in the process of generating precise and informative theories associated with the selected research topic.

In the case of this particular research study, both primary and secondary data collection methods are taken into consideration in order to enhance the depth, quality, and effectiveness of the whole research paper in an efficient way. In the case of considering the primary data collection method, the study has conducted an interview among five employees from the team of supply chain management of the selected organization Tata Motors in order to identify the role and effectiveness of risk management in the supply chain. These five participants for the interview session have specifically been selected through theory's LinkedIn profile (Säfsten and Gustavsson, 2020). The whole session of the interview has executed through Skype in order to identify and analyze the perceptions and reviews from the participants on the topic of supply chain risk management. In this specific interview session, all the participants were asked some specific open end questions associated with the selected research topic. On the other hand, in the specific approach of considering the secondary data collection method, this research paper has also utilized multiple secondary data sources in order to enhance the quality of the paper by adding more informative theories. Some of the secondary data sources that are utilized in this particular research paper are newspapers, articles, journals, books, magazines, websites, and more (Zangirolami-Raimundo, Echeimberg and Leone, 2018). The particular incident of considering both primary and secondary data collection methods can play a vital role in helping the research paper to improve its effectiveness in a precise and efficient way.

3.6 Data Analysis Techniques

This specific section of data analysis techniques can generally be considered one of the most vital chapters of the entire research methodology chapter. It can be considered impossible for the research scholars to efficiently execute the research analysis without selecting the proper analysis techniques. On the other hand, the specific approach of selecting the ideal and appropriate data

collection techniques can also be considered very effective in understanding all the collected information associated with the particular research topic chosen (Ngozwana, 2018). In most research papers, the research scholars generally select the data analysis techniques according to the considered research strategy. Since the qualitative research strategy has been taken into consideration by this specific research paper through both primary and secondary data collection methods, the study has selected the thematic tools as the most efficient analysis tool for analyzing the collected information. In the case of considering conducting an interview among the five employees from the team of supply chain management of the selected organization Tata Motors, all the responses from the respondents are typically and precisely compared and analyzed in order to identify the accurate information relevant to the different factors associated with the supply chain risk management (Bairagi and Munot, 2019). A transcript has been generated in order to analyze the responses collected from the interview in an efficient way. On the other hand, in the case of analyzing the qualitative data gathered from multiple secondary sources, the information is analyzed with the help of thematic tools. In the case of the minimum amount of quantitative gathered from multiple secondary sources, the data has been analyzed with the help of different kinds of statistical tools such as graphs, charts, tables, Ms. Excels, and more. All these data analytic tools can generally be considered very effective in playing a significant role in making sense of all the information that has been collected in the process of data collection. The wrong selection of data collection techniques can be very effective in decreasing the value and effectiveness of the research papers in a direct way (Säfsten and Gustavsson, 2020). Due to this, it is very important to select the appropriate data analysis techniques in order to achieve the most efficient and desired outcome.

3.7 Research Ethics

The particular chapter on research ethics can specifically be considered one of the most effective and significant chapters of the entire research methodology chapter. Ethics is one of the most vital factors that need to be considered and maintained by all research scholars in order to obtain an efficient result within a specific time limit. It is very unimportant for all the researchers to be honest and truthful in the entire process of executing the research papers. It can also be stated that research ethics can specifically be considered very effective in the process of obtaining the desired output within a specific time (Zangirolami-Raimundo, Echeimberg and Leone, 2018). It can also be considered very important for the research scholars to positively follow and maintain the impartial method in order to efficiently maintain the definite ethical consideration. In the process of data collection and data analysis, any case of biasness has not been considered in order to maintain the quality of the paper. On the other hand, all the measures and guidelines of general data protection have also been maintained and followed in the process of executing the whole research paper. Since this specific research paper has conducted an interview among the five employees from the team of supply chain management of the selected organization Tata Motors, the permissions from the participants have been considered before starting the whole process of interview. On the other hand, it has also been assured by this particular research paper that all the responses from the respondents are only be used in order to develop this theory, not any kind of commercialization purpose (Säfsten and Gustavsson, 2020). All these Actions could play a vital role in the process of reducing the impacts abs consequences of different kinds of future uncertainties. On the other hand, in order to avoid different kinds of social uncertainties, it is also very important to take permission from the authors of the theories that have been utilized in the process of data collection and data analysis. On the other hand, in the specific case of considering

the secondary data collection method, it is very important for the researchers to check the accuracy and reliability of the data sources that have been utilized in the research in order to maintain the quality and effectiveness of the paper (Zangirolami-Raimundo, Echeimberg and Leone, 2018). On the other hand, it can also consider very significant for the researchers not to reveal the whole process of data collection. In the case of this particular paper, all the sources that have been used in order to execute the study have also been destroyed in order to maintain the authenticity and quality of the research paper in an efficient way.

3.8 Research Limitation

This particular section of research limitation can specifically be considered one of the most effective areas in the whole research methodology chapter. This specific section of research limitation can be considered very beneficial in the process of identifying all the faults in executing the research methodology that could play a vital role in affecting the value and quality of the whole research paper (Cr, 2020). In the case of executing this specific research study, different kinds of difficulties have taken place in the whole executing process. This particular research paper has only considered the qualitative research approach, which played a vital role in preventing the whole research paper from being more precise, practical, and reliable. On the other hand, in the process of conducting the interview session, some respondents were confused in the period of giving their opinions (Mohajan, 2018). Due to this particular reason, some responses from the respondents were biased. This particular incident can specifically be considered the major limitation in the whole process of executing the entire paper.

3.9 Summary

After discussing the entire chapter on research methodology, it can specifically be stated that the paper has selected the positivism research philosophy in order to address all the research objectives

in an efficient way. On the other hand, in the case of the research approach, the deducting research approach has been selected in order to obtain an effective and fruitful outcome by guiding the whole research paper to be executed in an organized and specific way. The qualitative research approach has specifically been selected in this specific research paper in order to develop an efficient and precise theory on the topic of supply chain risk management. Both primary and secondary data collection methods have been utilized in order to enhance the quality and effectiveness of the entire research paper. In the case of the primary data collection process, an online interview session among the five employees from the team of supply chain management of the selected organization Tata Motors has been conducted in order to identify the effectiveness and role of risk management in the supply chain. On the other hand, the study has also considered multiple secondary data sources in order to enhance the depth of the whole theory. Since this specific research paper has considered collecting qualitative data from both primary data sources and secondary data sources, the study has utilized the effectiveness of the thematic tools in order to analyze gathered information that has been collected in the process of data collection.

Chapter 4: Analysis and Findings

4.1 Overview

The analysis and findings section is considered to be one of the most important sections of the research study. It helps in addressing the research question based on the data that is collected from different sources. The primary and secondary data collected for the research study will be analyzed in this section, and based on that, the findings for the paper will be generated. Both primary and secondary data would be analyzed by the scholar as it would be helpful in providing high-quality research for addressing the aim and objectives of the paper.

4.2 Primary Data Analysis

Here in this particular research paper, primary data has been taken into consideration. In order to analyze the preliminary data of this paper, the research scholar has in this paper has conducted interviews among 5 employees from the supply chain of Tata Motors. The primary purpose behind conducting the session of the discussion is to gather feedback from the employees of Tata Motors regarding the issues of the supply chain. The workers have unfathomable acquaintance concerning a variety of phases of supply chain risk management. They can provide a concise on the topic of the challenges being countenanced in the supply chain and how the managers handle them. All the workers have more than 2years of experience in handling the supply chains.

4.2.1 Importance of SCM in Maintaining Efficiency, Customer Demand and Productivity in Tata Motors

The first employee in the interview stated that SCM directly helps in enhancing customer satisfaction by providing the products to the customers within the stated time. Despite the

organization's size, it is very important to have an efficient SCM so that the service or products can add value to the customers.

The second employee from SCM of Tata Motors stated that by maintaining the organization's productivity and efficiency, the customers' expectations could be met. All these factors depend on how efficient the SCM is in the company.

The third employee said that the material management and business process involved with the SCM must be maintained to manage the organization's productivity, customer demand and efficiency. The organization's overall function is highly dependent upon the supply chain, thus making it an important area.

As per the fourth interviewee's view, various factors make SCM important for an organization. An efficient supply chain helps reduce the cost of the product, improve agility, provide better customer service, transfer and communicate the information, etc. All these factors result in improving productivity, efficiency and customer satisfaction level.

The last employee also stated that efficient supply chain management is very important for maintaining productivity and efficiency in the automobile industry. The organization must maintain a proper supply chain to deliver the final product to the customer within time with quality.

Lastly, it can be stated that by analyzing the employee's response from the supply chain department, it is evident that it is very important to have proper supply chain management to meet customer expectations. In this manner, the efficiency and productivity of the organization can also be maintained.

4.2.2 Steps Adopted by Supply Chain Managers to Manage the Chain Efficiently in Tata Motors

As per the first interviewee, Tata Motors takes various steps to improve its supply chain management. The supplier and customer are divided into two tiers that are first tier supplier and customer and the second tier customer and supplier. It helps the organization control the type of information flowing through the chain.

The second interviewee stated that the Tata Motor supply chain department focuses on obtaining information from the customer's end to manage the demand side. The information is collected directly or through the second-tier customer and then sent to the suppliers. SCM officials ensure that the correct information reaches the suppliers to avoid confusion.

The third interviewee discussed how Tata Motors focuses mainly on selecting the appropriate suppliers and then carries out the planning and controlling process for the supply activity. The company continuously focuses on improving and developing the capabilities of the supply chain.

As stated by the fourth employee being interviewed, the supply chain management also decides whether the component in-house should be made/ designed or should be outsourced from suppliers. The suppliers are encouraged to agree to the service level agreements so that the issues that can cause disturbance in the ongoing supply chain can be covered.

The last interviewee discussed improving and developing capabilities for the suppliers by enhancing the service and providing long-term commitment and supplier loyalty by Tata Motors. The company also use cross sourcing to improve the capabilities of suppliers.

From the above discussion, it is clear that Tata Motors has taken several steps to improve the organization's supply chain management. In this manner, the company tends to improve their performance and efficiency and meet the customers' demands.

4.2.3 Common Challenges Faced by the Team in Managing Different Aspects of SCM

As stated by the first interviewee, Tata Motors does face several challenges in the supply chain despite adopting effective measures for managing the supply chain. Among all the challenges faced by the company, the issues in the supply chain are considered the major ones. The global shortage of semiconductors due to the pandemic situation is the major challenge that has been impacting the production and sales of Jaguar Land Rover (JLR).

The second employee being interviewed stated that the shortage of effective tools for the manufacture of small passenger cars has been one of the significant challenges faced by the SCM of Tata Motors. Due to the war and lockdown situations in Ukraine and China, the supply chain of Tata Motors has been severely affected.

The third employee stated that the supply chain of Tata Motors is facing challenges due to the inflation rate. Supply chain management is facing various types of challenges due to the lockdown and war situation that is going on in the world.

The fourth employee also discussed the same challenges that were being discussed by the other employees previously. Due to the following challenges, Tata Motors is facing an impact on the profit margin, and customer satisfaction level is also being negatively impacted.

The fifth interviewee discussed how the challenges faced in the supply chain have resulted in the dropping of the revenue of JLR by 7% in FY22. The revenue came down to £18.3 billion, and the EBIT margin also fell to -0.4%, thus resulting in a £1.2 billion free cash outflow.

From the above analysis, it is clear that the SCM of Tata Motors is facing several challenges due to the global outrage of pandemic and war. The company has faced a shortage of materials due to the disruption in the supply chain, as a result of which the retail sales of the company has been declined by 14%.

4.2.4 Risks Faced in Supply Chain Management of Tata Motors

Based on the point of view of the first interviewee, the most common risk faced by supply chain management is the rapid change in technology with time. Due to globalization, the technologies used by the industries are rapidly changing. The scarcity of specialists and sources for supporting such change becomes a risk for SCM.

The second interviewee stated that the customers' evolving demands are a risk for SCM. The market is changing continuously as per the customer preferences; thus, the supply chains also need to be changed as per the changing customer demands. Inefficiency in meeting the customer's evolving demands can be a risk for the SCM.

When asked the third interviewee about the risk, it was observed that the environmental regulations and compliances resulted in a risk for the company's SCM. The environmental issues related to emissions and fuel impacts the manufacturing facilities and products.

The fourth interviewee stated various risks related to the SCM of the company, such as information and cyber security, geopolitical environment, volatile global economy, and exchange of the rate fluctuations that are faced along the supply chain management of Tata Motors.

The fifth employee also stated that the SCM of Tata Motors faces risks related to cyber security and the geopolitical environment. As the supply chain consists of vital information regarding the company, the presence of cyber threats can be a severe risk for the supply chain. Apart from that,

the supply chain expands in a global environment; hence the impact of the geopolitical environment on the supply chain is a risk factor for the company.

Hence it can be stated that various risks are faced in the supply chain of Tata Motors that negatively impact the overall performance of the supply chain. To carry out efficient supply chain management, it is important to address the following risks successfully.

4.2.5 Steps Adopted by SCM Managers for Managing the Risks and Challenges in Tata Motors

As discussed by the first interviewee, Tata Motors focuses mainly on mitigating the challenges and risks that impact SCM negatively. The company invests in R&D and improves the strategic focus of the company, thus addressing the key technological areas. The company is also focusing on the concept of electrification, autonomy, and connectivity for a competitive advantage.

The second employee also stated in the interview that the company focuses largely on adopting advanced technologies in supply chain management. The models of the vehicles have also been developed to meet the customers' evolving demands.

The third interviewee stated the different ways the company adopts to improve competitive business efficiency. The company has been focusing on reducing the complexities of the supply chain to improve the flow of information and resources along the chain. To avoid the risk of exchange rate fluctuations along the supply chain, the company has approved the policy of financial derivatives in line with the hedging policy.

The fourth interviewee discussed how Tata Motors focuses on making the supply chain more efficient through a cleaner manufacturing process and vehicles using advanced technologies. Security policies and procedures are being implemented into the supply chain management to

control the cyber threat issues. Certain internal tools are being implemented for detecting and mitigating threats.

The fifth employee from the interview stated that Tata Motors adopts various initiatives to expand the business in global aspects so that the volatile global economic and geo-political environment risks can be eliminated from the supply chain.

Hence it can be stated that despite the challenges and risks that the SCM of Tata Motors is facing, the company is also focusing on adopting various measures and strategies to eliminate the risks and make the supply chain more efficient. It helps in improving the productivity of the supply chain risk management.

4.3 Secondary Data Analysis

In the secondary data analysis approach, the scholar focuses upon analyzing the data that has been collected from different literary sources such as books, websites, articles, paper, etc. The analysis of the secondary data helps in providing an enormous range of extensive and original study for the research paper.

4.3.1 Analyzing the Evolution of Supply Chain Risk Management over Time

Supply chain risk management has evolved over time, and now it has become one of the most established factors for the industrial sector. Supply chain risk management plays a significant role in making accurate decisions for the functional areas of business (Prakash, Agarwal and Kumar, 2018). The initial stage of the chain was started in the era of 1960s. Slowly with time, it began to evolve, and after introducing the concept of digitalization in the supply chain, it started to adopt the concept of automation. For the characterization of the supply chain management evolution, it can be stated that there has been an increasing degree of integration among the separated tasks

involved. The trend of supply chain risk management was underlined during the 1960s as its key area of future productivity improvement. The logistic area had not faced many changes, but the areas of physical distribution and materials management in the supply chain went through large changes during the 1970s and 1980s. Further, it evolved in 1990 during the era of globalization, and then the logistic emerged in the true sense. The involvement of modern technology and digitalization in the supply chain resulted in integrating the management with the goods flow, finance and information (Sudan and Taggar, 2022). Thus it resulted in capturing the value and ensuring competitiveness. The figure below shows the different phases of the evolution of supply chain risk management.

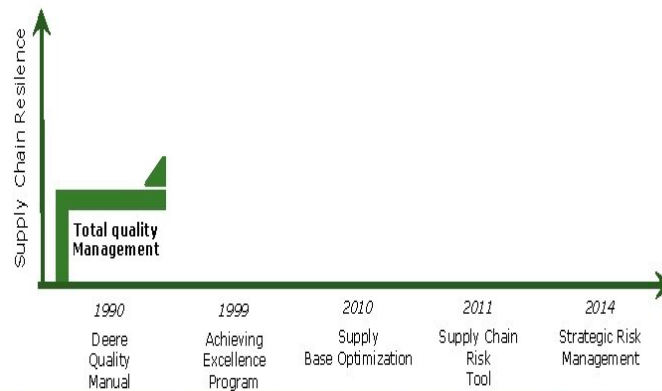


Figure.1: Evolution of Supply Chain Risk management

(Source: Xie et al., 2020)

4.3.2 Impact of the SCM Related Risks upon Efficiency and Productivity of Tata Motors

The presence of risks in an organization related to the supply chain management results in poor performance of the organization. The important factors such as inventory costs, responsiveness, lead time and flexibility of the organization are being negatively impacted due to the risks. Different types of risks can be faced by the organization related to supply chain management (Khot

and Thiagarajan, 2019). The most common risks the automobile industry faces are economic, environmental, supply, operational, and social risks. However, Tata Motors focuses on taking certain initiatives to build sustainable relationships with supply chain partners. The supply chain management of the automobile companies is considered to have a complex supply chain. Due to the lockdown in the Chain, the supply chain management of Tata Motors has been severely impacted as the suppliers were being unable to deliver the products. Thus it leads to the forced stopping of production in the plants. Thus it can be stated that, due to the presence of the risk in the supply chain management, the company's production was negatively impacted (Prakash, Agarwal and Kumar, 2018). Apart from that, the company also faced the challenge of chip and semiconductor shortages that adversely impacted the production of Jaguar Land Rover during 2021-2022. Such risks lead to a challenging situation within the organization, thus impacting the reputation, customer satisfaction, profitability and revenue production. The figure below shows how the risks along the SCM lead to a rise in disruption in the supply chain.

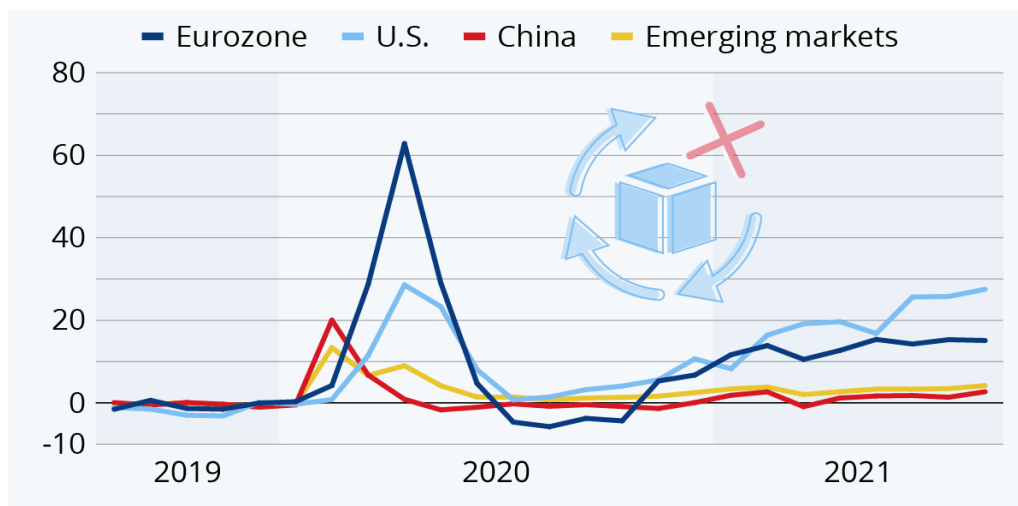


Figure.2: Disruptions in Supply Chain Due to the SCM related Risks

(Source: Khot and Thiagarajan, 2019)

4.3.3 Critically Analyzing the Challenges Faced During Managing the Supply Chain

While managing the supply chain of an organization, the managers face different types of challenges that arise for different reasons. Some of the challenges faced during managing the different aspects of the supply chain are scarcity of materials, an increase in the prices of freight, inaccurate demand forecasting, changes in consumer behavior, digital transformation, etc. Due to the presence of the following challenges, it becomes difficult for the supply chain managers to sufficiently manage the flow (Laschat and Ehrmann, 2021). Due to the presence of the following challenges along the supply chain management, the operations and production of the industry get slow or delayed. The challenges can occur due to various reasons such as the effect of the pandemic, peak seasons, inflation, etc. However, interruptions are faced in the supply chain due to the following challenges, and thus the productivity and profitability rate also goes down significantly. It impacts the competitive advantage of the company as well as the satisfaction level of the customers. Such challenges in the supply chain management also delay the delivery of the final products, thus impacting the reputation of the company negatively (Kwaramba, 2019). The figure below shows the rate of different challenges faced in managing the supply chain. It can be observed that the rate of challenges caused due to inaccurate demand forecasting is higher among all the challenges. Due to the impact of lockdown in the business sector, it has become very tricky to conduct demand forecasting for the products, thus impacting the supply chain management.

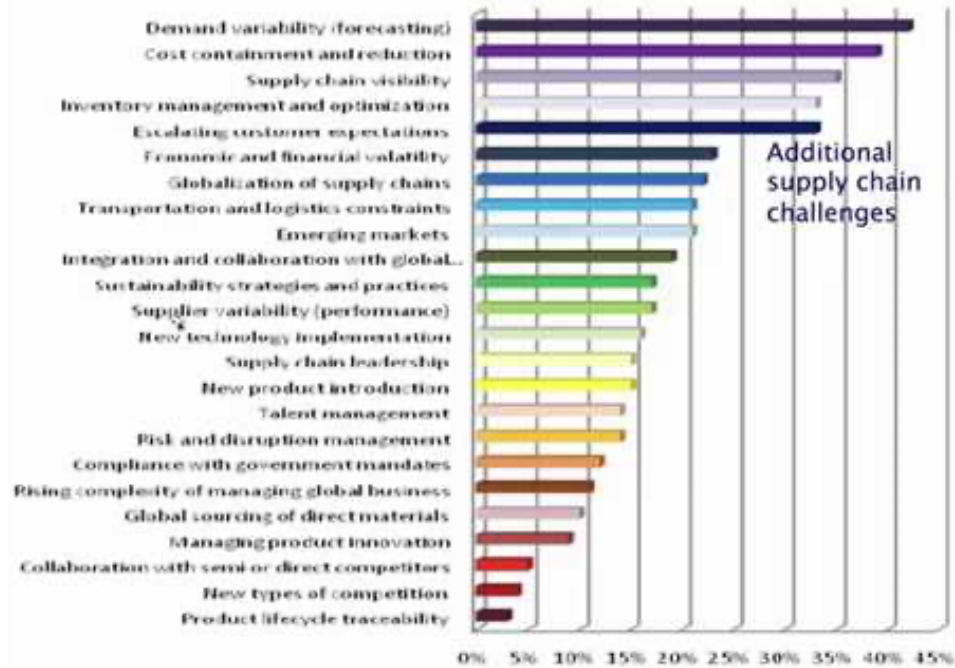


Figure.3: Percentage Rate of the Presence of Different SCM Challenges

(Source: Sudan and Taggar, 2022)

4.3.4 Relationship between the Supply Chain Risk Management and Financial Performance of the Organizational Operations

The maintaining of the supply chain management in a data-driven and strategic approach helps in obtaining fruitful results in the long term for the organization. It helps the business to evolve over time. The key areas that can be improved through efficient supply chain management are inventory accuracy, inventory to sales ratio turnover, etc. The following areas help in improving the financial performance of the organization significantly (Xie et al., 2020). As suggested in the figure below, through the efficient SCM, the graph of inventory to sales can be seen to take a hike, thus signifying improvement in the sales. On the other hand, the cost of carrying the inventory can be observed to decrease from the graph given below. The inventory turnover is also maintained to a certain level without any significant fall, which states that an efficient SCM results in higher turnover from the

inventory (Laschat and Ehrmann, 2021). In this manner, SCM helps in hitting the target of 92.4 of inventory accuracy and the out-of-stock items are also maintained at a range of 0.94%. Therefore it can be stated proper management of the inventory is being carried out through the proper SCM. It ultimately leads to improving the financial performance of the organization. Apart from that, a high performed SCM also helps in lowering the rate of return of the item, thus boosting the profit ratio and increasing the cash flow of the company.

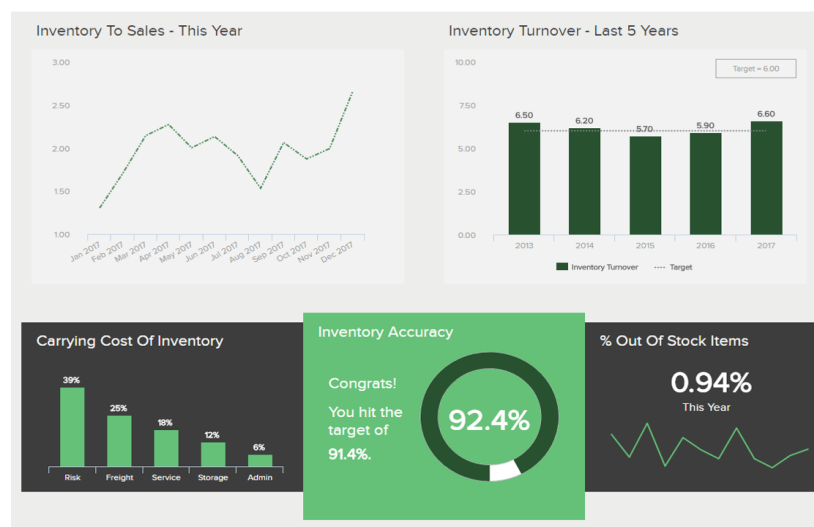


Figure.4: Impact of SCM upon Various Areas of Financial Performance

(Source: Garg, 2019)

4.3.5 Comparative Analysis of the Risk Factors Faced in SCM between Ford Motors and Tata Motors

Proper maintenance of the supply chain management in the automobile industry is a complex task, and each of the companies has its unique way of managing the supply chain (Kwaramba, 2019). The supply chain risks faced by Tata Motors and Ford Motors are quite different from each other. The supply chain of Ford Motors faces threats due to the isolationist trade policies of the US. The imposing of the steep tariffs on Mexican and Chinese imports by 35% and 45% resulted in a

profound impact on the sales of Ford Motors. However, the supply chain of Tata Motors has been impacted by the Covid-19 lockdown. Most of the suppliers of Tata Motors are from China; hence during the pandemic, the supply chain was severely impacted, and it negatively affected the production of the final products (Garg, 2019). Therefore it can be stated that both Ford Motors and Tata Motors have been facing certain risk factors in their SCM due to different issues.

4.4 Findings

Through the analysis of the secondary and primary data in the following section, important information regarding the supply chain risk management of Tata Motors has been discovered. The scholar has conducted an interview with 5 employees from the supply chain department of Tata Motors. In the interview, the employees were asked about the importance, challenges, risks and strategies of the supply chain risk management of Tata Motors. It has been observed from the following interview that Tata Motors being a global automobile company, is immensely dependent upon supply chain management. The supply chain management for the company helps in maintaining the production of the company through availing the accurate information regarding the demand of the product from the customers and finally delivering the final product in the allocated time (Sharma, Raj and Chakraborty, 2022). However, Tata Motors mainly depends on suppliers from China for the parts and tools used for manufacturing the vehicles. Due to the pandemic situation, the supply chain between China and Tata Motors has been abruptly disrupted. As a result, the production of the Jaguar Land Rover was negatively impacted. The global scarcity of semiconductors has also led to impacting the supply chain management of Tata Motors (Vinod, Ravishankar and Sivakumar, 2020). Apart from that, it has also been observed that the company's SCM faces various challenges and risks due to technology advancement, changes in customer

demands, cyber security threats, etc. In order to control and manage the respective challenges and risks, the supply chain managers adopt various strategic measures and procedures.

Through the secondary data analysis, it has been observed that supply chain risk management has evolved with time, and now it has been integrated with the latest digitalized technologies for better efficiency and performance. All the industries are now focused on adopting the supply chain risk management approach to improve the productivity of the companies. However, the SCM also comprises various risks and challenges that have the possibility to impact productivity and efficiency in a negative approach if not addressed at the correct time (Yanamandra, Pranav and Charitha, 2020). In the analysis section, the different types of risks associated with supply chain management have been discussed. It has also been observed that the presence of the risks along the supply chain, such as scarcity of resources, results in a negative impact on the production and manufacturing process. The presence of risks along the SCM results in rising disruptions in the supply chains. From the analysis section, it was evident that the supply chain of Tata Motors is facing certain risks and challenges due to the pandemic and war situation that led to the scarcity of semiconductors (Sharma, Raj and Chakraborty, 2022). It further disrupted the manufacturing process of Jaguar Land Rover, thus impacting the product's sales revenue. The comparative analysis between Ford Motors and Tata Motors revealed that both the company faces risks in supply chain management, but the reasons behind the risks and challenges are different in both aspects. Therefore the analysis section has successfully analyzed the concept of the supply chain risk management of Tata Motors.

4.5 Summary

The analysis and findings section has successfully discussed all the important factors associated with the supply chain risk management of Tata Motors. In order to carry out the analysis in an in-depth scenario, the scholar has chosen to conduct both primary and secondary data analysis. The section has successfully revealed the importance of supply risk management in maintaining the production and efficiency of Tata Motors.

Chapter 5: Discussion

5.1 Supply Chain Management of Tata Motors

Supply chain management is basically a process of planning, operating, executing, and controlling of operational activities of the organization. Effective supply chain management practices leverage logistic operations in order to synchronize with the market demands. As the automobile sector contributes a significant amount of resources towards the country's economic development, it can be said that this sector is the strong pillar of the global economy (Arora et al., 2019). Tata Motors manufactures and sells automotive products to the global market, and in order to maintain the company's overall business operations, the company needs to focus on the advancement of its supply chain network. It can be found from the literature review chapter of the dissertation that the company is totally relied on third parties to ensure the supply of raw materials and items. Along with this, Tata Motors concentrates on the application of advanced technologies for the foundation of the supply chain network. Focusing on these attributes while preparing a supply chain network allows Tata Motors to operate its business cost-effectively (Craighead et al., 2020). Additionally, it can also be found that by making a connection with local dealers, Tata Motors efficiently designs its distribution networks in order to deliver finished goods on time. While choosing suppliers, the company checks the capability of suppliers. It positively affects the production process of Tata Motors. Apart from this, the company also contributes a significant amount of financial resources to its R&D department to eliminate complexity in the supply chain network (Ali et al., 2019). From the findings of the chapter, an effective supply chain management process truly supports automobile companies in bringing fruitful outcomes within the business context. In meeting the company's long-term goals, project managers focus on designing SC networks by installing emerging technologies. By maintaining the processes of the supply chain, inventory turnover can

be positively maintained. One of the major competitors of Tata Motors, Ford Motors, witnessed SCM threats due to its isolated trade policy. The covid-19 pandemic brings uncertainties in the supply chain networks of all players in the automotive industry. Along with regional dealers, Tata Motors is totally relied on the Chinese market for purchasing raw materials. Because of the recent pandemic, the relationship with the Chinese market was disrupted, which negatively affected the business operations of Tata Motors. After gathering details from the literature review and findings sections, it can be asserted that Tata Motors has an effective supply chain that has a significant impact on business efficiencies, but the automotive firm experiences certain challenges and risks in managing the supply chain. To overcome those hurdles, the company needs to implement certain effective measures.

5.2 Supply Chain Management Risks of Tata Motors

Based on the scholarly literature of this research, it can be asserted that proper bottom-line initiatives must be taken into consideration in order to minimize the likelihood of a diverse range of consequences. Globalization, social pressure, and market uncertainty are the major driving factors which lead to SCM-associated risks for automobile companies like Tata Motors (Junaidi, 2020). Being a multinational automobile company, Tata Motors witnessed numerous issues, like inefficiency in managing foreign subsidiaries, delays in legal proceedings, issues in managing workforces, communication barriers, financial obstructions, and others in managing the supply chain. Considering the scholarly information in the second chapter of the dissertation, Tata Motors failed to manage economic risks, and it resulted in the maximization of the product costs (McMaster et al., 2020). As this automobile firm is operating businesses in different locations and environments, the company needs to follow the environmental policies of the operated markets. By operating businesses in different locations, it is difficult for Tata Motors to follow each and

every environmental policy of different locations. However, the company truly focused on the pollution and sewage water management process to ensure that the company runs its operations in an environment-friendly way (El et al., 2021). Additionally, in the automobile sector, one of the major SCM risks is logistics and distribution associated risk. Due to the lack of technically skilled professionals, Tata Motors failed to manage its distribution channel through automation. From the literature review portion of the work, it can also be found that social risks also negatively affect the effectiveness of the supply chain management process ((Baryannis et al., 2019). In the case of Tata Motors, inappropriate work ethics, poor corporate policy and poor employee engagement policy are considered the major social risks that bring adverse effects on the company's business operations (Mukherjee, 2022).

On the other hand, according to the data analysis portion of the dissertation, the unavailability of the semiconductor in the supply chain process during the process of the recent pandemic is one of the major challenges, which is faced by Tata Motors(Prakash, Agarwal and Kumar, 2018). Due to a shortage of advanced tools and approaches, the company fails to manufacture small passenger-based vehicles. It is another booming problem of Tata Motors' supply chain. China and Ukraine are the major countries where the company purchases its raw materials, but due to the war and lockdown, Tata Motors' supply chain is severely affected (Xie et al., 2020). Moreover, the high inflation rate is another risk for Tata Motors in managing its supply chain networks. Changes in buying behavior after the pandemic adversely affect the profit generation process of Tata Motors (Khot and Thiagarajan, 2019). Because of the issues in the supply chain network, a downfall in the revenue structure has been witnessed. Based on the information from the literature review and findings chapters, it can be comprehended that Tata Motors has faced certain unavoidable challenges during the recent pandemic time. Supply chain managers of this automotive company

focus on adopting certain strategic measures for addressing the SCM challenges within the organizational context for attaining the corporate goals.

5.3 Challenges Faced By the Supply Chain Managers in Managing Efficiencies of the Supply Chain

According to previous literature, it can be asserted that material scarcity is considered one of the biggest challenges, which is confronting almost every automobile company across the globe during the time of the recent pandemic. Currently, companies are struggling to meet the increasing demands of the market due to the restricted flow of raw materials. The scarcity of raw materials is accountable for the high dependency on working capital that negatively affects the financial strength of the company (Baryannis et al., 2019). On the other hand, due to the trade restrictions and lockdown, the import and export costs are automatically increased. Tata Motors and other automobile companies have no other options to spend the unexpected amount of resources for purchasing raw materials and exporting finished goods to different places (Mouloudi et al. 2022). After Covid-19 hits, people were not spending their money on luxurious products, but they preferred to spend money on necessary products. For this definite reason, it may create difficulties for Tata Motors to forecast product and service demands. Moreover, immense changes in consumer buying attitudes create a hurdle for the supply chain management process of Tata Motors. It also creates problems in the agility of the supply chain (Behzadi et al., 2018). Digital transformation brings significant business opportunities for companies in order to boost productivity and profitability. Robots, drones, artificial intelligence, and electric vehicles are the outcomes of the digital transformation. By implementing the outcomes of the digital transformation in the supply chain operations, automobile companies can be successful in maximizing their organizational effectiveness. However, due to the lack of technical expertise,

Tata Motors cannot successfully implement digital transformation within its supply chain and distribution channel. It became a challenge for this automobile firm to carry out operations efficiently in diverse locations (El et al., 2021).

According to the data analysis chapter, globalization is primarily responsible for technological advancement. The rapid changes in technologies after globalization bring opportunities as well as threats. The shortage of technically skilled associates in the organization is the main barrier to the supply chain network. Without making regular interactions with customers, Tata Motors cannot determine the actual demands for its products (Khot and Thiagarajan, 2019). Apart from this, the covid-19 pandemic has a direct effect on the changes in buying behavior. Immense changes in the buying pattern of customers lead to problems for Tata Motors in forecasting customer demands. The dimension of the market is changed frequently, which also creates hurdles for Tata Motors' supply chain network (Kwaramba, 2019). The company fails to meet its environmental concerns, which is also becoming a problem for the firm in managing the supply chain network. The geopolitical environment, cyber threats, fluctuation in the exchange rate, and volatility of the global economy are the driving factors that are responsible for the supply chain risks of Tata Motors (Xie et al., 2020). Based on the literature review and findings chapter, it can be comprehended that the undertaken automotive brand is unable to maintain its performance in terms of delivering products to customers on time, productivity, and profitability because of the disruptive supply chain network.

5.4 Measures Taken By Tata Motors for Eliminating Supply Chain Risks and Challenges

From the literature review of this paper, it can be asserted that Tata Motors focuses on utilizing the multi-source model in designing the contingency plan for managing and resolving associated risks of supply chain management (Prakash et al., 2018). A fundamental problem is found in the

business model of some automobile companies. Multisource is one of the ways to mitigate SCM risks. By categorising suppliers, Tata Motors can purchase raw materials from a wide range of suppliers (Abdel-Basset et al., 2020). Without doing an in-depth search of characteristics of suppliers, the company generally does not make contracts with those suppliers for purchasing raw materials. Moreover, by putting an immense focus on the 'nearshore' approach, Tata Motors can minimize the times of cycles of purchasing raw materials and delivering finished goods to customers (Fan et al., 2018). This automobile company focuses on choosing regional suppliers rather than international suppliers to ensure the availability of raw materials. It helps in reducing the travel time. Additionally, the undertaken automobile company emphasized the conduction of the stress test regularly in the supply chain network. Through this test, the company can be efficient enough in determining the vulnerabilities within the supply chain network (Raghunath et al., 2018). Based on the previously published scholarly journals, it can be comprehended that Tata Motors focus on the investment of products and harmonization of factories, having a motive to reduce the likelihood of supply chain inefficiency. It can be found from the literature review chapter of the dissertation that technological advancement brings opportunities to the supply chain network (Fan et al., 2018). However, after installing advanced technologies and machinery, the players in the automobile sector witnessed severe cyber threats that negatively affected business efficiencies and operations. Phishing, ransomware, and hacking are the common threats which are facing Tata Motors while carrying out its operations through an advanced supply chain network (Ivanov, 2018). It can also be found from the literature review section that Tata Motors should do regular market research in order to understand customer demands. By installing various initiatives, this automobile company successfully minimizes the business complexity. Due to the increasing trend of diesel uncertainty, Tata Motors recently focused on manufacturing electric vehicles. It

truly supports this firm in fulfilling its environmental responsibilities, along with avoiding SCM challenges (Gao et al., 2020). From the findings chapter of this dissertation, it can be said that Tata Motors invests significant amount of resources in the R&D process for generating strategic innovative ideas, so that the automotive firm can efficiently resolve the challenges in the supply chain network. Regular feedback has been gathered from the end of existing customers, so that the company can determine its loopholes. Advanced technologies have also been implemented in the supply chain network in order to boost the operational efficiencies, and Tata Motors concentrates on this aspect (Xie et al., 2020). Therefore, by taking proper effective measures, Tata Motors can efficiently minimize the SCM risks and challenges.

5.5 Common Issues Observed In Tata Motors

As discussed in the literature review section, due to the foreign business presence of Tata Motors, it faces various challenges in the supply chain. The challenges are mainly faced due to the communication gap, ethical barriers, legal uncertainty, etc. From the analysis of the interview conducted among the employees of Tata Motors, the same issue has been observed to occur. There are a number of issues that Tata Motors face in the place of the market; one of the common issues of Tata motors is that because of its dependence of Tata Motors on China for supplies, it has faced a global shortage of semiconductors that has led to an impact the production of Jaguar Land Rover negatively. Apart from this, Tata Motors does not have proficient tools for producing small passenger cars and also lacks a network of sellers (Sudan and Taggar, 2022).

Another common issue that has been observed in the section literature review and the chapter findings is the scarcity of materials due to the pandemic situation. Because of the lockdown government announced lockdown all over the globe, and supply chain management was heavily interrupted; as a result, Tata Motors faced tribulations regarding the materials required for the

production of the cars. On the other hand, the other common issues are the frequent change in the customers' attitude and difficulty in demand forecasting after the pandemic as the Covid-19 pandemic and social distancing, and the lockdown authorizations have interrupted the habits of buying behavior of customers in addition to shopping. Patrons are learning in order to manage and discover new ways of life (Xu et al., 2020). For instance, patrons cannot go to the stores; because of this, the store arrives at to dwelling. At the same time, patrons go away from their previous way of life; it is expected that they will be customized by new-fangled systems and actions in how clients shop and acquire products and services. New-fangled behavior will also come from technological advances, varying demographics, and ground-breaking habits patrons have learned to deal with vague impressions of work, free time, and edification limitations. Apart from this, during the pandemic, the rules and regulations got changed, and Tata Motors's consumer habits also altered. On the other hand, because of the international shortage of the global semiconductor, the prices of the car amplified; as a result, Tata Motors suffered faced a considerable loss in their business. On the other hand, SCM-related risk factors faced by Tata Motors are another common issue that has been found in both the section of the literature review and the data analysis and findings (Xie et al., 2020).

5.6 Different Issues Observed in Tata Motors

Apart from the common issues, it can be stated that in both sections, a number of diverse issues have been observed in Tata Motors. The literature review segment has discussed the discernment of the public regarding diesel-powered vehicles amid the fall in the sales of diesels. Due to the fall in diesel sales, the supply base of Tata Motors is getting disrupted. However, the findings and analysis chapter has not concentrated on this issue. Apart from this, the findings section has discussed the intertwined relationship between an organization's financial performance and supply

chain risk management (Yang et al., 2018). The research scholar has not presented the intertwined relationship between an organization's economic performance and supply chain risk management in the literature review section. Based on this, it can be asserted that the fall of the sales of diesel is concerned as one of the essential issues that have been observed in Tata Motors because this significant problem has impacted the business of Tata Motors heavily, but in the chapter of findings, the issues regarding the fall in the sale in the diesel have not been mentioned. These are some problems that are not common to both discussion areas. Thus, these are some of the significant issues observed in the literature review section and the data analysis and findings.

5.7 Other Important Supply Chain Issues

The supply chain encompasses diverse sorts of risks that impact the efficiency and competence of the association. Apart from the issues that have been discussed in the literature review section and the findings section of the research paper, there are also various other types of supply chain issues of equal importance. There are a number of major issues that are interrelated with the supply chains; some of the other issues apart from the major issues are the risk management, supplier relationship, quality consumer service, and a lot more. On the other hand, a poorly designed schedule is considered to be a common risk that leads to delays in the supply chain. The delays in the supply chain ultimately lead to delays in the production of the final product, thus resulting in customer dissatisfaction. The schedule risk can also lead to further cost implication on the entire process, thus leading to losses for the organization. A poorly designed schedule leads to changes in the schedule (Sudan and Taggar, 2022).

Sometimes because of the lack of the quality of the materials one of the major problems that have been faced by the supply chain is the quality consumer service. For the lack in the quality of the materials supply chain fails in order to provide quality consumer service. Apart from this, Due to

the inadequate planning and assessment in the supply chain management, the risk of ineffective management can arise. The occurrence of a trade war can also be considered a risk for the supply chain management. On the other hand, some of the major troubles that has been faced by the supply chain management are the sustaining conventional inventory approaches, be deficient in of actionable information and insights, slowed digital revolution, and many more (Yang et al., 2018).

Another risk that the supply chain can face is the lack of appropriate planning and control. Because of the insufficient development and estimation in supply chain management, the risk of unproductive management can take place. The incidence of a trade war can also be well thought-out a risk for supply chain management. Apart from this, because of the amplifying tension of the global trade, new-fangled import taxes have been obligatory on a variety of consumer manufactured goods and industrialized components. Due to this, many firms are focusing on adopting the supply chain based on the circumstances. On the other hand, because of the extreme change in the climate, the management of the supply chain was heavily impacted (Sudan and Taggar, 2022).

Chapter: 6. Conclusion and Recommendations

6.1 Conclusion

From the discussion which has been mentioned above, one can get the idea regarding the supply chain management of Tata Motors. In the business, the magnitude of the supply chain is elementary because, for the augmentation of the business, the significance of the supply chain is critical. The foremost responsibility of the effective supply chain is to elevate revenue through enhanced consumer contentment, as in order to put on triumph in the place of the market, one of the decisive

aspects is to meet the requirements of the consumers and gratify them. On the other hand, risk management of the supply chain is unbeatable as the procedure which mitigates, identifies, and reviews the supply chain management of the specific organization. Apart from this, some of the essential qualities of supply chain risk management are the rapid response, visibility, and analysis of the scenario. In the management of the supply chain of a particular organization, there are four types of risks presented that are ethical, economic, political and environmental. On the other hand, in some of the cases of the organization, like unpaid bills and disruption of transport, the risk management of the supply chain is considered one of the essential aspects.

Apart from this, some of the techniques that are employed by the management of the supply chain are manufacturing, planning, resourcing raw materials, returns and delivery. On the other hand, as per the categorization of the supply chain risks, there are three types of risks: artificial, catastrophes, and economical. The purpose of the risk management of the supply chain in the particular organization is interrelated with the characteristic of putting off a number of issues along with making available a loss alleviation of numerous events related to the risks takes place. Some of the advantages of the risks management of the supply chain are that it makes sure the production and liberations are implemented optimally, has the swift capability in order to act in response to unanticipated events, and upholds and increases the satisfaction level of the consumers regarding the manufactured goods and so on. On the other hand, to analyze the risks associated with Tata Motors, the risk management of the supply chain plays a fundamental role as it lends a hand to the business of Tata Motors in order to avoid the risks in the place of the existing market and achieve more success as compared to its rivalries that are presented in the place of the market.

In the chapter of the introduction, the background of the research topic has been discussed, which is the supply chain risk management of Tata Motors. On the other hand, the researcher has also

discussed the research problems. Apart from this, four of the objectives have been developed by the researcher are to analyze the supply chain risk management of Tata Motors in order to diminish the wastes from the supply chain of Tata Motors, determine the risks sensitive parameters of the supply chain that are responsible for the supply chain, the role of the supply chain of the risks management in order to perk up the financial performance of the Tata Motor, and lastly, the number of benefits of the supply chain risks managements. On the other hand, in the part of the literature review, a comprehensive theoretical knowledge regarding the supply chain risks management of Toto Motors has been presented along with some of the significant points that are interrelated with the research topic. Apart from this, in the chapter on the research methodology, the researcher has adopted accurate methods to carry on the research paper systematically; among all the philosophies, the researcher in this paper has chosen pragmatism philosophy.

On the other hand, among the three approaches, the deductive approach has been selected in a systematic way. Apart from this, in this specific research paper, the researcher has considered both the primary and secondary data to collect information regarding the research topic. In the chapter on the analysis and findings based on the secondary data analysis, the information regarding the research topic has been gathered from websites, journals, articles and many more. On the other hand, for the primary data the researcher here accomplished a survey. On the other hand, in the chapter of the discussion, the entire topic is based on the chapter of findings. Lastly, it can be said that in order to avoid risks, Tata Motors has adopted a number of steps, and the significance of supply chain risk management in Tata Motors is far above ground.

6.2 Recommendations

Based on the above discussion, it can be said that there are a number of recommendations that are required to subsequent by Tata Motors to achieve accomplishment and avoid the risks in their

business. Some of the recommendations for the supply chain risks management of Tata Motors have been presented below:

Recommendations: 1

One of the primary recommendations for the supply chain management of Tata Motors is that the company must develop their potential to recognize and prioritize the risks associated with the organization. Without recognizing the risks, it will not be possible for Tata Motors in order to mitigate those risks and carry on the business smoothly in the place of the market (Bhole and Shrivastava, 2021). On the other hand, Tata Motors must develop risk awareness in their firm to make the employees aware of the particular risks. Information is supremacy, and having a workforce with a precise acquaintance with supply-chain risks puts the corporation in an enhanced situation to covenant with notorious and unidentified risks. With this in wit, Tata Motors necessitate generating a risk-aware ethnicity in their production by implementing member of staff training and sensitization concerning such risks. On the other hand, Tata Motors must develop an environment that motivates responsibilities, openness, and respect (Rao, 2020).

Recommendation: 2

Another recommendation for the supply chain risks management is that Tata Motors requires strengthening its defenses the cybersecurity, as in the digital epoch, approximately every corporation has its processes online. At the same time, going digital increases firms' supply chain's competence, but it also puts the company at the menace of cybercrime. Cybersecurity intimidations such as malware and ransomware, phishing, and assaults can interrupt Tata Motors' operations of the business, leading to enormous losses (Shibin et al., 2018). For this reason, Tata Motors requires to tighten its cyber security system. On the other hand, before dealing with the supply chain, a specific company requires to have an in-depth understanding of the supply chain so that they can

handle the management of the supply chain efficiently and also will be able to avoid risks. Today in this world of digitalization, many problems are occurring due to hacking; because of this, a number of tribulations arise in this regard. Tata Motors requires to stay aware of cybersecurity (Eachempati et al., 2022).

Recommendation: 3

Apart from these two recommendations, another crucial recommendation for the supply chain risk management of Tata Motors is the understanding of the diverse types of risks associated with the management of the supply chain. Without the proper understanding of the risks that are associated with the supply chain, it will not be possible for Tata Motors in order to mitigate those risks in an efficient way (Kaviani et al., 2020). For this reason, Tata Motors needs to develop its comprehension of the risks which are interrelated with the supply chain. Understanding both the external and internal intermediaries is significant. Apart from this, Tata Motors must strategically plan regarding the supply chain as, without the proper approaches, it will be impossible for the company to carry on the supply chain effectively (CHAUDHARY and CHAUHAN, 2022).

Recommendation: 4

The last recommendation for the Tata Motors supply chain risk management would be the company must invest in new technologies so that it will lend a hand to the business to grow effectively in the place of the market. In this world of digitalization, advanced technologies are required in order to carry on the supply chain in an efficient way (Anbarasan, 2021). On the other hand, in order to evaluate the information in the supply chain, the importance of advanced technology is significant. Some advantages that supply chain management assists in bringing in the supply chain risk management are the resolves the tribulations associated with the data for ML and AI, bringing more visibility regarding the information and so on. For this reason, Tata Motors

must adopt advanced technologies to enhance its supply chain risk management (Ali, Kaur and Jaramillo, 2018).

6.3 Future Research Scope

In this research study, the researcher has considered both the primary and the secondary data, which will give the future researcher chances to take both the secondary and the primary data into account. This paper of the research has taken into consideration the company Tata Motors for the research; as a result, in the near future, the future researcher can take up the other automotive industries in order to demeanor such study. Some aspects of supply chain risk management have not been discussed by the researcher in this paper, which has developed the research scope for the future researcher.

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Appendices

Appendix A: Interview Questions

1. How is the supply chain important in maintaining the customer demand, efficiency and productivity of Tata Motors?
2. What are the steps taken by the management of Tata Motors to manage the supply chain efficiently?
3. What are the challenges the supply chain managers face in managing the different aspects of supply chain management?
4. What is the most common supply chain management risk faced by Tata Motors?
5. What are the steps taken by the supply chain managers of Tata Motors to manage the risks and challenges to maintain the competitive advantage of the company?

Appendix B: Interview Transcript

1. **Interview with the 1st employee from Supply chain management department of Tata Motors**

Interviewer: Hello, thank you for taking part in the interview. So can we start the interview?

Interviewee: Yes sure.

Interviewer: How is the supply chain important in maintaining the customer demand, efficiency and productivity of Tata Motors?

Interviewee: I think the supply chain management of the company helps greatly in enhancing the customer satisfaction level through an improved productivity and efficiency of the product. An efficient SCM ultimately leads to adding value to the products/ services for the customers.

Interviewer: What are the steps taken by the management of Tata Motors to manage the supply chain efficiently?

Interviewee: As it has been witnessed by me, Tata Motors divides the category of suppliers and customers into tiers known as the first tier and second tier. It helps the company to manage the flow of information between customers and suppliers without any confusion.

Interviewer: What are the challenges the supply chain managers face in managing the different aspects of supply chain management?

Interviewee: Our SCM team faces various challenges while managing the supply chain of the company. Recently we had been facing the issue of semiconductor shortage due to the lockdown situation which has impacted our Jaguar Land Rover production.

Interviewer: What is the most common supply chain management risk faced by Tata Motors?

Interviewee: The risks that we commonly faced in the SCM of Tata Motor are the rapid change in the technology. In order to adopt the changes financial support and expert are required and without that the company lags behind in the competition.

Interviewer: What are the steps taken by the supply chain managers of Tata Motors to manage the risks and challenges to maintain the competitive advantage of the company?

Interviewee: We tends to adopt various strategies for the managing the risks and challenges along the supply chain. The company takes decision upon investing in the R&D so that the focus of the company can be made strategic and the key technological areas can be addressed successfully.

Interviewer: Okay thank you so much for your precious time. It would be greatly helpful for my research. Bye, have a good day.

Interviewee: It was my pleasure. Bye.

2. Interview with the 2nd employee from Supply chain management department of Tata Motors

Interviewer: Hello. As discussed earlier I would like to ask few questions for my research. Can we start?

Interviewee: Yes sure.

Interviewer: How is the supply chain important in maintaining the customer demand, efficiency and productivity of Tata Motors?

Interviewee: As per my knowledge, the SCM helps the company greatly in meeting the expectations and demand of the customers. The SCM allows flowing of the information swiftly in the organization so that it can be collected from the customers and sent to the suppliers and producers. In this manner the efficiency, customer satisfaction level and productivity is met through SCM.

Interviewer: What are the steps taken by the management of Tata Motors to manage the supply chain efficiently?

Interviewee: The SCM of Tata Motors obtains all the information from the customers that help the company to manage the demand side of the supply chain. It also helps in fulfilling the demands of the customers and we are solely responsible to check that correct information from the customer end is reaching to the suppliers.

Interviewer: What are the challenges the supply chain managers face in managing the different aspects of supply chain management?

Interviewee: Lately we had been facing challenges such as shortage of effective tools that are used for the manufacturing of small passenger cars. As the result of the lockdown in China and war in Ukraine our supply chains had been abruptly disturbed and we facing insufficiency of raw materials and tools.

Interviewer: What is the most common supply chain management risk faced by Tata Motors?

Interviewee: The evolving demands of the customers are a significant risk for us when managing the supply chain. Due to the changing of the customer's demand the market is also changing and coping up the supply chain with the changes is a significant task for us.

Interviewer: What are the steps taken by the supply chain managers of Tata Motors to manage the risks and challenges to maintain the competitive advantage of the company?

Interviewee: We focus largely upon adopting the advances technologies to improve the efficiency and productivity of the SCM. The designing of the vehicles is based upon the information collected from the customer to meet the demands of the customers.

Interviewer: Okay. Thank you so much for the informative details. Bye, have a good day.

Interviewee: Bye. Have a good day.

3. Interview with the 3rd employee from Supply chain management department of Tata Motors

Interviewer: Hello. Can we start with the interview?

Interviewee: Yes please.

Interviewer: How is the supply chain important in maintaining the customer demand, efficiency and productivity of Tata Motors?

Interviewee: I personally think SCM plays a major role in managing the materials and business process and thus maintaining the efficiency, customer demand and productivity of the company. Tata Motor is highly dependent upon the SCM for carrying out the operations and production successfully.

Interviewer: What are the steps taken by the management of Tata Motors to manage the supply chain efficiently?

Interviewee: The management of Tata Motors focuses upon choosing the appropriate suppliers for getting the supply of raw materials on time. Identifying honest and trustworthy suppliers is important to manage the flow of supply chain in the company. Various digitalized technologies are also being adopted for the improvement of supply chain.

Interviewer: What are the challenges the supply chain managers face in managing the different aspects of supply chain management?

Interviewee: According to my view, due to the high inflation rate the supply chain is facing challenges such as insufficiency of the raw materials and tools and cost of the materials is also rising. Thus the supply chain managers are facing financial issues.

Interviewer: What is the most common supply chain management risk faced by Tata Motors?

Interviewee: The environmental compliances and regulations are also considered as a risk for the SCM in Tata Motors. The inability of the supply chain to address the environmental issue is a common risk that is faced by us in Tata Motors.

Interviewer: What are the steps taken by the supply chain managers of Tata Motors to manage the risks and challenges to maintain the competitive advantage of the company?

Interviewee: We focus largely upon reducing the complexities of the supply chain so that the different tasks involved in the supply chain can be carried out without any risks or challenges. We also use the policy of financial derivatives in line with the hedging policy so that the exchange rate fluctuations in the supply chain can be eliminated.

Interviewer: Thank you so much for your precious time. Bye, have a nice day.

Interviewee: Thank You. Bye.

4. Interview with the 4th employee from Supply chain management department of Tata Motors

Interviewer: Hi. Can we start with the interview?

Interviewee: Yes please.

Interviewer: How is the supply chain important in maintaining the customer demand, efficiency and productivity of Tata Motors?

Interviewee: As per my knowledge, the SCM in Tata Motors helps in managing various factors of the organization such as the cost of the product, agility, improved customer service, transferring

information, etc. The following approach of SCM helps the organization to maintain the productivity, customer demand and efficiency.

Interviewer: What are the steps taken by the management of Tata Motors to manage the supply chain efficiently?

Interviewee: The management of Tata Motors is responsible for making the decision that whether the component in house should be designed or outsourced from the suppliers. Our management also encourages the suppliers to agree with the service level agreements so that the disturbances in the supply chain can be covered.

Interviewer: What are the challenges the supply chain managers face in managing the different aspects of supply chain management?

Interviewee: Well in such situation where we were hit by the pandemic, war and inflation many challenges arises along the supply chain. The suppliers were unable to supply the materials as a result of which the production of the products got disturbed significantly.

Interviewer: What is the most common supply chain management risk faced by Tata Motors?

Interviewee: When it comes to supply chain management, we faces a lot of cyber attack risks in Tata Motors. Apart from that we also face other risk in the supply chain management such as threat of geopolitical environment, exchange of rate fluctuations, volatile global economy that creates a negative impact.

Interviewer: What are the steps taken by the supply chain managers of Tata Motors to manage the risks and challenges to maintain the competitive advantage of the company?

Interviewee: We focus upon adopting several strategies for the supply chain such as adopting the latest technologies, security policies, security tools, efficient employees so that the risks and challenges along the supply chain can be maintained.

Interviewer: Thank You for your informative feedback. Have a nice day. Bye

Interviewee: Thanks. Bye.

5. Interview with the 5th employee from Supply chain management department of Tata Motors

Interviewer: Hello. As discussed earlier I would like to ask few questions for my research. Can we start?

Interviewee: Yes sure.

Interviewer: How is the supply chain important in maintaining the customer demand, efficiency and productivity of Tata Motors?

Interviewee: According to my view, the supply chain of Tata Motors proves to be helpful in maintaining the customer demand, efficiency and productivity in various ways. It allows flowing of information, helps in collecting customers ideas and demands, supplies the raw materials, etc. therefore it is important to have an efficient SCM within the organization.

Interviewer: What are the steps taken by the management of Tata Motors to manage the supply chain efficiently?

Interviewee: We focus upon improving and developing certain capabilities for the suppliers through enhancing the service and providing supplier loyalty so that the suppliers do not create any disturbances along the supply chain.

Interviewer: What are the challenges the supply chain managers face in managing the different aspects of supply chain management?

Interviewee: Due to the unavailability of the semiconductors the production level of Jaguar Land Rover was being dropped significantly. Due to the following issue the revenue and EBIT margin of the company also dropped by 7% and -0.4% and now the managers are facing huge problems in managing the supply chain.

Interviewer: What is the most common supply chain management risk faced by Tata Motors?

Interviewee: Among all the risks faced in the SCM, the threats associated with cyber security and geopolitical environment can be stated most common. We have a global based supply chain and also focus upon expanding it further that increases the chances of geopolitical environment risk. The increasing dependency upon digitalized technologies is increasing the chances of cyber threats in the supply chains.

Interviewer: What are the steps taken by the supply chain managers of Tata Motors to manage the risks and challenges to maintain the competitive advantage of the company?

Interviewee: We are focusing upon expanding the supply chain of Tata Motors further globally in order to manage the geopolitical environment and volatile global economic risks successfully.

Interviewer: Okay. Thank you so much for the informative details. Bye, have a good day.

Interviewee: Bye. Have a good day.