

Performance And Risk Management Practices in Supply Chains

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Abstract — There is augmented establishment of supply chain management (SCM) by companies worldwide, to gain a competitive advantage. The profits of executing a systematized quality management system are well authenticated. The objective of the study is to propose a rational approach to assessing and managing risks in the supply chain. Supply chains are intrinsically vulnerable to risky occurrences. The significance is to study the risks that result from interrelated flows of materials, communication, and resources in inter-organizational webs. Though, in the last several years, the importance of this topic has meaningfully gained momentum. A substantial body of topical literature reports on events that disturbed supply chains and on their negative impact on businesses.

Risk management enacts a vital role in realistically operating supply chains in the existence of a variety of ambiguities. Risk Management has become important in avoiding business failures. Logistics interruption can come from an unexpected exogenous result including an earthquake or from an endogenous event, as the Toyota Quality recalls in 2010 interrupted the company's logistic operations and reduced its performance. Throughout the years, numerous researchers have been engrossed in supply chain risk management (SCRM) by underwriting the parts of defining, operationalizing, and diminishing risks. In this paper, I study and synthesize the existing literature on SCRM in the past few years in a complete manner. The objective of this paper is threefold such as a) to perform and classify SCRM research showing between 2015 and 2020, b) to assume itemized assessment related to research developments in supply chain risk descriptions, kinds of risk, risk features, and risk management/ extenuation plans, and c) to evaluate the SCRM literature in studying possible breaches. The result of various risks can be accomplished through the right sequence of risk management methods. Although there are inadequate monitoring activities, imperfect operating measures, and substandard attitude by the staff.

Thus, with the purpose of achieving development in market share and productivity in the long run through boosting organizational performance, it is better for the company to provide importance to builds of SCM strategy, measurements, and procedures.

Keywords — **Supply chain, Risk management; Risk types; Risk factors; Risk management process.**

I. Introduction

In the presence of the global economy, supply chain management (SCM) performs an essential role in the company to endure competitive and cohesive with world markets. A supply chain (SC) must support the flow of a huge amount of information and a diversity of products thru all its stages. The company must have to distribute in the right quantities, to the right places at the right time to meet the two purposes: minimum costs and maximum customer service levels.

Though, just like some other systems, the SC is also exposed to different kinds of risk, both from upstream and downstream. These various risks may occur due to external sources like natural disasters, economic crises, terrorist attacks, or internal activities within the company, such as an interruption in supply, security breaches, etc. Though risk management can support by supporting a company's management system, policies, developments, and practices to address and observe these risks and afterward be able to arrive at a risk management decision. It stipulates a well-defined and systematized approach to classifying risks, such as technical risks, economic risks, financial risks, performance risks, and regulatory risks. Most successful companies are still determining the foundation sources of the so-called "competitive advantage" which is the way to discover fruitful systems. The supply-chain management embodies all those combined activities that create products to market to produce satisfied customers. The supply Chain Management Program incorporates topics from manufacturing operations, purchasing, transportation, and physical distribution into a unified program. The effectiveness of supply chain management, then, should organize and integrates all these activities into a unified process. The fiscal value of supply chain expenditures is the highest in manufacturing organizations (Dey et al. 2011). However, SCM risks are presumed to be non-financial risks in the customary sense of risk both in finance and insurance.

Risk management refers to the execution of various strategies and plans to achieve supply chain networks all the way through invariable risk assessment and lessen weaknesses to realize flexibility in supply chains. Not all supply chains pose the same risks, but some risks are common. However, building a robust supply chain is expensive (Vahid Nooraie and Parast 2016). Numerous research articles have suggested the need for such supply chains due to the magnitude of the adverse effects of risk on its performance.

The organizational performance involves frequent activities to determine structure goals, monitor progress toward the goals, and build changes to attain those goals. Most organizations read their performance in terms of effectiveness in achieving their mission, purpose, or goals. At a similar time, most organizations additionally see their performance in terms of their potency in deploying resources. This relates to the best use of resources to get the results desired. Also, for a corporation to stay viable over time, it should be financially viable and relevant to its stakeholders and their dynamic needs. In recent years, offer chain disruptions have compacted the performance of companies. to manage and mitigate the negative effects caused by such risks, a vital quantity of work within the space of supply chain risk management (SCRM) is undertaken in each world and professional circle. SCRM is a very important area thanks to an incident's cascading effects on supplying networks (Cigolini and Rossi 2010). Some samples of such events embrace Sep 11, the Gulf War, the outbreak of an endemic (e.g., bovine spongiform encephalopathy, coronavirus illness 2019, COVID-19), and the millennium bug. These troubling events have compelled practitioners to explore the vulnerabilities in supply chains and assess risks. Vulnerabilities in a very supply chain rely on the provision chain. Moreover, the COVID-19 pandemic has resulted in disruption to the mechanics of most economies, regardless of their size and section of

development. Globalization, shorter product lifecycles, many-sided networks of trade partners situated in several countries, uncertainty in market demands, price pressures, outsourcing, and offshoring are several risks in SCM (Hachicha and Elmsalmi 2014; Lavastre et al. 2012).

Conversely, risk management is one of the maximum exciting and crucial pillars to assure the accomplishment and fulfillment of any project, as a result, it is miles motivating to speak about risk management practices, both to get enjoy the experience. Successful risk management allows for an advantage and decisive blessings over competitors. Therefore, it is miles vital to recognize the ideas of risks and risks management and to enforce them additionally into popular methods in supply chain management.

Literature Review

In supply chain management, it is far essential for industries to broaden and prepare networks of activities involved in the procurement, manufacturing, and delivery of products globally. Since its advent in the early 1980s, supply chain management (SCM) has become to be one of the most popular concepts within management in general and inside logistics in particular (Charles et.al, (2014). Strangely, project management, even though it deals with “modern” technologies, is embarrassingly immature in the mastery of risks.

“Risk management refers to strategies, methods, and assisting tools to discover and control risk to an acceptable level” (Alhawari et al. 2012). Additionally, risk management can also be called a synchronized set of actions and procedures to direct a company to decrease the risk of achieving organizational goals. Managing risks allows the decision-maker to recognize and verify the effect of risk in a supply chain network. Similar recriminating records 12 months after a year remind us that about 20 percent of the projects are canceled before completion and less than a third are finished on time and within budget with anticipated functionality. Obviously, powerful risk management is needed to keep troubled projects and make aggressive risk-taking possible. Recently, Bandaly et al. (2013) supplied a scientific and systematic literature review (SLR) of price risks. It was noticed that most of the above overview articles are informative in nature and centered on providing theoretical viewpoints and expecting methodologies. However, most of the review papers fail to offer the entire information about the selection procedure of the articles, sample size, clarification methods, etc.

Even it is only after a risk has been recognized and measured that true risk management can be performed. These initial steps are therefore important but do not themselves amount to risk management. Highlighting these prioritizing risks so that each can receive the suitable time and resources is as essential as identifying and assessing risks. One of reasons the company’s ability to move from the initial stages to effective management can ultimately determine the effectiveness of a risk management plan. Meaningfully some assessments must be detailed and accurate for any further steps to be meaningful and efficient. Shashank & Goldsby, (2009) indicated that the supply chain contains the flow of materials, goods, and another supply chain from one place to another.

In this whole system, the products and materials, and services incur changes to the ownership. Similarly, the means of transportation also occur. In the process, the risk is recognized as the improbability that at any instance, the deviations from the expected results can cause a company's financial results as well as a loss of the firm's value.

Ghadge et al., (2013) argued that the products' complexities and flow of materials increase the number of processes, ways of delivery, geographical locations, and economies of different companies, etc., which improve susceptibility in the supply chains. Stressed that commercial enterprises apply different forms of risk management processes to handle different risks because they face a variety of risks while carrying out their business operations. The proper and useful handling of risk ensures the successful growth of an organization. There are numerous types of risk management that can be characterized into the following: Operational risk management: Operational risk management deals with methodological failures and human errors. Financial risk management: Financial risk management conducts non-payment of clients and increased the rate of interest. Market risk management: Deals with various types of market risk, such as interest rate risk, equity risk, commodity risk, and currency risk. Credit risk management: Deals with the risk associated with the probability of non-payment from the nonpayers. Quantitative risk management: In quantitative risk management, an effort is accepted to numerically determine the possibilities of the different adverse financial conditions to control the degree of loss that might arise from those circumstances. Commodity risk management: Handles various kinds of commodity risks include including price risk, political risk, quantity risk, and cost risk. Non-profit risk management: An approach and procedure where risk management companies offer risk management services on a non-profit-seeking basis. Currency risk management: Deals with changes in currency prices. Enterprise risk management: Handles the risks faced by enterprises in accomplishing their goals. Project risk management: Deals with risks associated with the undertaking of a project. Integrated risk management: On the other hand, it is the supervision of market, credit, and liquidity risk at the same time or on a simultaneous basis. Technology risk management: It is the procedure of managing the risks amalgamated with the implementation of new technology. Software risk management: Deals with different types of risks associated with the execution of new software.

Aqlan et al., (2015) suggested that alleviating supply chain risks is an essential area of research as a segment of supply chain management. Currently, operation management in firms is considered it is an area of importance and keen attention because of the increasing occurrence of risk events and their effect to supply chains. Ho et al., (2015) identified in which several qualitative and quantitative methods had been developed depending on the nature and severity of the risks, and the difficulty of supply chains, dealing with supply chain risks. Supply chain risks need to be first described in a precise way, only then an effective risk management plan can be improved. In this way, the capability of a firm to identify the sources of risk in the chain helps in the business enterprise's growth.

In the whole system, there are various risks in the SC when unexpected events disrupt the flow of materials or products in their journey from initial suppliers to final consumers. The risk management process is a dominant part of any organization's strategic management. Normally it is the practice whereby organizations systematically address the risks attached to their activities with the goal of achieving sustained benefit within each activity and across the portfolio of all activities. In other words, the center of good risk management is the affinity and treatment of these risks. Its main purpose is to add maximum sustainable value to all the activities of the organization. It is occurring in which the risk prioritization comprehensively identifies risks in a level matrix with probability and impact. Hence, the risks are divided into different categories of risks. These classes already require different risk management approaches (Eccles and Obe, 2010). Ultimately, by different methods, all risks will be mitigated according to different risk mitigation approaches. An undefined business environment causes supply chain risks. The upbringing in business is uncertain and results from cyclical business behavior, fluctuation in demands, or a disaster. (Tang 2007). Thus, ambiguity may be seen as a risk that can disrupt supply chain performance. Several authors have classified risks in supply chains under operational risk, network risk, and external risks (Handfield and McCormack 2008).

Risk management must be an incessant and evolving process that runs throughout the organization's strategy and the implementation of that approach. In this way, it would address methodically all the risks surrounding the organization's activities past, present, and future. It should be built into the culture of the organization with an efficient policy and a program led by the most senior management. It must convert the strategy into tactical and operational objectives, assigning responsibility throughout the organization with each manager and employee responsible for the management of risk as part of their job description. It aids accountability, performance measurement, and reward, thus promoting operational efficiency at all levels. The assessments exposed certain material weaknesses in the policies and practices employed by certain broker-dealers to manage risk, some of which are listed below, followed by examples of sound practices also noted during these reviews. It also can effectively consider the potential drivers of risk, and the situations in that risks can influence each other, or small risks may add up to serious ones. (Haselkorn et al., 2015).

(Gurtu et al. 2015, 2016). The approximation of risk can lead to better risk management, reduce the extent of damage, and improve supply chain resilience. In this way, the long-term investment in an organization's robust supply chain network will reduce operational costs and be flexible enough to the changing and viable business environment. Toyota has applied these principles in its supply chains and minimized the disruptions due to product recalls (Bates et al. 2007).

From the various perspective that evolved the crucial challenge of supply-chain risk management has been exacerbated by globalization, where even sensitive products like the use of raw materials, circuit boards, and related components may have originated in countries where the

system manufacturer did not even know it had a supply chain. This augmented difficulty has brought with it more possible failure points and higher levels of risk.

II. Methodology

The study was anchored on the principle of risk management practices that evolved through the writer Clifford W. Smith Jr. The principle states that risk management practices are the issues or the reasons that influence organizational overall performance absolutely to keep away from any possible risk. Hence, evading those risk factors will produce a healthful venture that is manageable in the price range and cope with external factors.

The center of the risk management practices in the evaluation and consideration of technical risks, economic risks, financial risks, performance risks, and regulatory risks; accompanied by coordinating the resources to minimize, monitor, and manage the possibility and/or effect of these risks or to maximize the realization of opportunities. The technical risks have demonstrated the activities such as engineering, manufacturing, technological approaches, and procedures. The economic risks are the risks with the purpose to be economically unsustainable, for a variety of reasons ranging from a change in monetary tendencies to fraudulent activities which devastate the results or outcome of the project. At the beginning of the projects, economic risk needs to be taken into consideration to decide whether the potential risks are outweighed by the benefits. The project's output will now no longer generate enough sales or revenues to cover operating expenses/costs and to pay off debt obligations.

Financial risks are the probability of loss inherent in the company's financing methods, which may ruin its ability to endow adequate return. The company will not have adequate cash flow to sustain financial obligations.

Performance risks are a concern in the buyer's mind that the stipulated service will not be as expected. Companies are always learning and adapting various systems that will be engrossed in their development to meet goals or objectives.

Regulatory risk refers to any changes in the regulations and guidelines that manipulate and manage the business as well as the market.

The company is surrounded by many risk factors: technical risks, economic risks, financial risks, performance risks, and regulatory risks. The risk management practices must have the ability either to avoid those risks or decrease or transfer them to achieve the desired goal which is successful project performance. The company needs to realize in the early stages of operation that those ambiguities or certainties will happen.

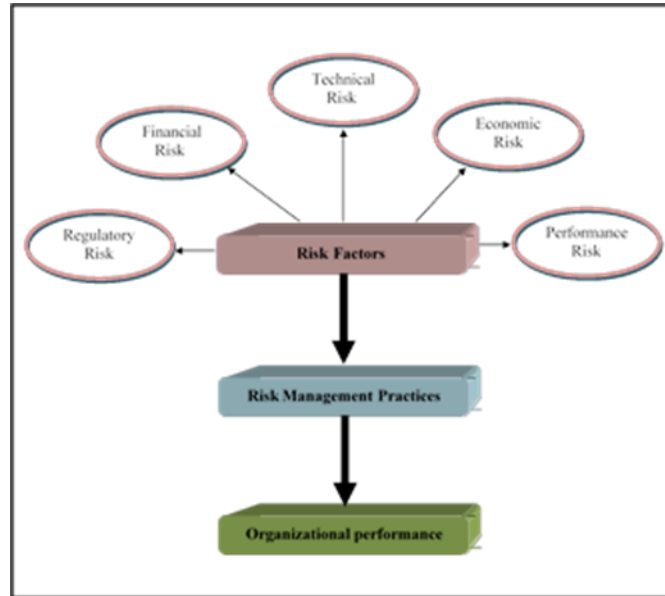


Figure 1: Theoretical Framework

The diagram in figure 1 (developed by Paolo A. Pesenti) depicted the theoretical framework of the study. The theoretical framework is best and very applicable for the organization under study. The theoretical framework is unsurpassed and very appropriate for the business under study, which is for the company's supply chain operation. Consequently, such organizations with this kind of working style must apply risk management practices to build the implementation of the projects.

The result of the output was generated through the analysis and interpretation of the data and the responses of the employees as well as the correlations of the perceptions of the respondents. The final output or the product of the study is the basis for the enhancement of risk management practices to elevate the project performance of the company. The development is hypothetical to continue after gathering the feedback in each phase to enhance each phase of the model.

This indicates that there is a definite cause (or causes) of the risk factors. Nonetheless, due to ambiguity, the risk can happen, but it need not occur. The result of risk on the company (if the risk occurs) can be negative or positive. Then, if we fulfilled practice the supplier selection:

- the CAUSE can be the inevitability of to decline in the cost of a product, it is the certain fact
- the IMPROBABILITY is in the prices and quality of potential traders, and it regulates the RISK
- the OUTCOME can be cost-saving (POSITIVE EFFECT) or on the opposite side the result of the delay and increased cost (NEGATIVE EFFECT)

Thus, there are two methods that need to implement: the base plan and base calculation are prepared in the development phase of the contract and the risk should be also embraced in the calculation. The two principal approaches stated above can be used to determine the risk of supplier selection:

- the base plan contains estimated cost savings during the supplier selection – then the RISK can be defined as the THREAT that the saving will not be attained
- the base plan is prepared conservatively with no savings and the RISK equals the OPPORTUNITY to attain certain saving

In this way, some risks can be treated both as threats and opportunities – these risks are called business risks. There are also other risks that can have only negative outcomes, e.g., the risk of breakdown, fire, and injuries – these risks are called pure risks. All the risks should be properly managed to fulfill the contract on time and within budget. Even in times of crisis or stagnation, it is necessary not only to protect against threats but also to look for opportunities.

III. Results and Discussion

The assessments were presented on diverse variables: nature of business, consumers profile, years of operation, company capitalization/asset size, project size, and cost, company infrastructure, technical risks, economic risks, financial risks, performance risks, regulatory risks, project opening and setting up, strategic planning, production management, project completion and hand over and lastly financial assets. Supply chains oblige a repossession plan to ease the effects of disasters, their needs are involved such as to be a strategic plan because uncertainties and risks surround the supply chain environment. Consequently, swift recovery is the main objective after Risks 2021, 7, 14 11 of 18 a risk the incident has happened. The development of suitable risk recovery models is also necessary for planning and a mixture of materials and data as well as human intermediation. Considering that there are insufficient authors who have suggested empirically grounded research tools in SCM (Jüttner et al. 2010), systematic hierarchy processes (Vanany et al. 2009), intricacy and graph theories (Colicchia et al. 2012), and further research in SCRM.

Hence, the researcher discovered that risk management has the propensity to be accommodating and changeable to avoid technical risks absolutely and execute in the best way paralleled with other organizations or parties. The variable resulting in technical risks was one of the most imperative dimensions to address and pledge their overall practices“ effectiveness and organizational performance.

Accordingly, the findings showed that continuing the production process effectively helped to minimize and diminish the economic risks to a very high extent and this will support the organizations to perform much better. As regards the economic risk items, the respondents were

undisputed in their agreement. “Thus, the company is able to struggle with the emergence of serious competitors”

TABLE (1) REPRESENTS THE RISKS THAT WERE IDENTIFIED BY THE BEVERAGE MANUFACTURING FIRM. THESE WERE THE MOST COMMON RISKS THAT OCCURRED FREQUENTLY.

No.	Identified risks by the organization (Factors are: Technical risks, Economic risks, Performance risks, financial risks, and Regulatory risks)
1	Supplier nonconforming product or service or materials
2	Order fulfillment errors
3	Inaccurate forecasts on demand
4	Competitor pricing
5	Lack of investment to sustain competitive advantage
6	Lack of customer requirements and satisfaction analysis
7	Processes are delayed due to insufficient or limited resources
8	Suppliers do not meet delivery deadlines
9	Breakdown of transport vehicles
10	Weak or ineffective control of supplier and customer systems, policies, and procedures
11	Information and communication technology errors
12	Lack of compatibility of IT infrastructure among supply chain partners
13	High cost of production capacity
14	Change in product or service design
15	Lower product revenues
16	Labor disputes or strikes
17	Accidents and human errors
18	Natural disasters – floods, lightning strikes, disease, epidemics

Under this study, the complexity of this growth affects not only the strategic considerations of industrial companies but is also a constant constituent of their daily business. The technical risks of the companies must meet the necessary high requirements on all levels, from the supply chain design top down to the supply chain operation. This is obvious that industrial companies currently show obvious deficiencies in performing and managing instabilities within their supply chains. As a result of economic risks, an understanding of the above disturbances and their effects on the supply chain as well as appropriate integration of cross-company disturbance management is not developed. Even a basic integration and real-time data flow will be problematic if supply chain partners lack trust. While the performance risks of the whole supply chain will suffer some negative results if partners have no inducements or spurs to orchestrate their technology with the others. Financial risk experiences by the company have three important case scenarios to explore the effects of a set of financial risks on the manufacturer-supplier relationship and the behavior of suppliers as regards risk profile, both in the short and long-term horizon. The findings are analyzed absolutely from both the supplier’s and manufacturer’s viewpoints the optimal conditions are

conferred under the cascading risk conditions. This SCRM study provides multiple insights into the effect of financial risk on supply chain relationships and will be indispensable for dealing with identical uncertain economic issues in the environment.

The findings show that even the best supply chain risk compliance management cannot eliminate regulatory violations from happening altogether. Yet, some measures and processes based on a thorough risk assessment will provide the best protection against regulatory risk stemming from the supply chain.

IV. Conclusion

The study provides a theoretical risk assessment framework. This sustains that the supplier organization is vigorous and has effective systems employed for the management and customer needs. The organization's behavior should build on strong relationships with suppliers to enhance an effective and efficient quality management system. The outcome of the study shows that supplier who provides raw materials and other resources to organizations, resulting to have considerably affected the quality of the final product and leads to customer satisfaction. The risk management process was an exploratory study conducted to evaluate the strengths and weaknesses of suppliers focusing on the risks associated with the supply chain. Poor supply chain performance could lead to poor quality of goods and services.

As a result, companies that are facing high-risk projects are completed more efficiently than projects with low stages of perceived risk. This study also determined that environmental context affects the extent of the perceived project risk. On the other hand, we determined and perceived the stage or level of risks. Regarding this, the company must have planned better in cultures that would be reflected in certain stages of uncertainty to avoid venture maturity (e.g., engineering). While we used a couple of foci to foster the robustness of our findings, generalization of those effects and additional studies on a wider cross-phase or section of companies are susceptible.

Theories suggested in this paper—open forums might also be useful for organizations with low stages of uncertainty to mitigate risks and improve value. Thus, operation managers when discussing the risks should clearly discuss their advice and have a clear direction for the group team to meet the company's objectives.

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