

Research on the Risk Identification and Evaluation of Enterprise Supply Chain under Major Public Emergencies

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Abstract

Under the background of globalization, the complex economic and social environment leads to the constant change of the supply chain system and the huge risk of management. Especially in recent years, the frequent occurrence of natural disasters, major public events, production accidents, product quality and safety accidents and other emergencies around the world has broken the smooth state of the supply chain, and even caused the rupture of the supply chain, causing great harm to the normal operation of the supply chain system. The risk of the supply chain stems from the uncertainty of the internal and external relations of the supply chain system and among the members of the supply chain. However, the occurrence of emergencies increasingly leads to the prominence of this uncertainty. The supply chain risk caused by emergencies is increasing, and it is increasingly difficult for the supply chain to recover from the failure caused by emergencies. Therefore, it is urgent to study the supply chain risk management under emergencies.

Keywords

Major Public Emergencies; Supply Chain; Risk Identification; Risk Assessment.

1. Introduction

This paper takes the emergency point, selects the supply chain risk management process as the research perspective, and studies the supply chain risk management problem on the basis of analyzing the own research literature. Firstly, the risk factors of the general supply chain are analyzed from the internal and external factors of the supply chain. On this basis, the system analysis method qualitatively analyzes the supply chain risk from the external environment of the supply chain, supply chain system and supply chain resource flow. It aims to study how to identify, evaluate and manage supply chain risks. First, it expounds the definition and classification of supply chain risks, then points out how to identify and evaluate supply chain risks, and finally puts forward effective measures to strengthen the ability of risk prevention and control, and effectively avoid risks.

2. Supply Chain Risk

2.1. Definition and Classification of Supply Chain Risks

(1) Definition of supply chain risk

Supply chain risk refers to the existence of various uncertain risk factors in the occurrence of a risk event, thus affecting the normal operation of the entire supply chain. Specifically, it can be understood as a risk that may arise in the process of providing services or materials to an enterprise. The occurrence of supply chain risks will not only disrupt the normal operation of the whole supply chain, but also may affect the operation and management performance of the enterprise, causing a certain degree of loss to the enterprise.

(2) Classification of supply chain risks

Supply chain risk can be divided into different categories according to different standards. The most common one is divided into internal risk and external risk according to the source of supply chain risk. The internal risks of the supply chain specifically include moral hazard, information transmission risk, trust crisis risk, enterprise difference risk, logistics operation risk and organizational production risk. The external risk of the supply chain refers to the risk brought about when the external objective environment changes, including the risk of economic fluctuation, natural environment risk, political change risk, monetary risk, legal risk and market demand risk, etc.

2.2. Identification and Assessment of Supply Chain Risks

(1) Identification of supply chain risks

Supply chain risk identification can understand the process of identifying and judging the risks it is currently facing, or the potential risks it may face. To implement supply chain risk management, enterprises first need to identify supply chain risk. In the supply chain risk identification, enterprises should follow the following steps. First, in the daily operation process of the enterprise, must have the relevant institutional constraints and management, clearly understand the status of the composition and distribution of the participants and the participants of each link in the supply chain, handle the relationship between the various nodes in the supply chain, coordinate the interests of each participant; next, businesses need to adopt a range of methods, identify the risks or may be faced by each participant, and timely estimate the likelihood of this risk, determine the possible hazard level and consequences of the risk; last, the result of the enterprise's response to the risk identification, summarize and summarize in time, take good preventive measures to deal with the arrival of risks at any time.

(2) Assessment of the supply chain risk

Supply chain risk assessment refers to the estimation of the possibility of a risk or the harm that the risk may cause. Timely and actively supply chain risk assessment, is a very important and indispensable work, reliable supply chain risk assessment is not only the basis of risk prevention and control measures, can also provide the basis for the future enterprise managers can according to the results of risk assessment, make relevant decisions and take corresponding preventive measures. When conducting the risk assessment of the supply chain, enterprises must base themselves on the whole, coordinate the overall situation, conduct a comprehensive assessment of the supply chain risk from the overall perspective, and pursue the maximization of the overall benefit. If enterprises only see the losses suffered by some enterprises, but ignore the overall maximum benefits, it is easy to put the cart before the horse, ignore one and lose the other, which is not conducive to the long-term stable development of the enterprise supply chain. In addition, the impact of supply chain risk on enterprises can be divided into direct impact and indirect influence. Enterprises should not unilaterally focus on the direct impact of supply chain risks, if the economic loss that can be intuitively felt is the direct impact of the risk; enterprises should also focus on the indirect effects of supply chain risks, such as the adverse impact on enterprise reputation. In some time and place conditions, the consequences of the indirect effects may be more severe than the direct effects. Therefore, from the perspective of long-term development of enterprises, enterprises need to pay attention to the research of supply chain risk identification and evaluation management caused by risks.

3. Supply Chain Risk

3.1. Meaning of Emergencies

The term emergency is first proposed for emergencies in the public domain, that is, public emergencies. From the own literature, many scholars have conducted in-depth research on the definition of public emergencies.

The connotation of these public emergencies is embedded in the supply chain to get the definition of supply chain emergencies. On the one hand, because the supply chain system has the characteristics of multi-subject, cross-region and multi-link, its external factors (such as natural environment, social environment, economic environment, market environment), and other bad public emergencies have a significant impact on the supply chain system. On the other hand, the emergencies occurring within the supply chain system will also have a huge impact on the effective and efficient operation of the supply chain. For example, a major accident or organization of a participant in the supply chain will directly cause the smooth production process, supply process and transportation process of other enterprises in the supply chain, thus affecting the stable and efficient operation of the supply chain. From the analysis, the content of the supply chain risk management emergency is rich, multi-level, including supply chain external factors (natural disaster, financial crisis, etc.) has a significant impact of public emergencies, including the internal factors of the supply chain system (supplier's sudden exit, information error, etc.) caused by emergencies.

3.2. Impact of Emergencies on the Supply Chain

No enterprise can accurately predict the arrival of emergencies, nor can it make a very perfect plan to deal with the emergency crisis in advance. As a chain composed of famous enterprises, the operation situation of the supply chain is much more complex than that of a single enterprise, and the prediction of emergencies is even more difficult. These emergencies may occur in various areas of the supply chain, including economy, human resources, logistics, corporate image, natural environment, information and so on. Such as the sudden outbreak of the financial crisis, the company's core information leakage, raw material supply interruption, market demand suddenly increase or decrease, credibility damage, natural disasters will bring huge losses to the supply chain and even fatal blow, so that when emergencies to perfect supply chain design-also feel back hand. The occurrence of emergencies in the supply chain will have a negative impact on the supply chain. This impact is manifested in both direct and indirect aspects. Correspondingly, when the emergency shocks the supply chain, the supply chain will suffer both direct losses and indirect losses. Direct impact refers to the loss of most or all of the functions of the accident nodes on the supply chain network, resulting in the interruption of the whole supply chain, the damage of the supply chain revenue, and even threatening the survival of the node enterprises. Direct losses include the loss of sales and sales loss caused by the product's failure to meet the demand. The indirect impact is a serious and long-term impact. In an emergency, the supply chain partners may question other management problems of the enterprise at the accident node of the supply chain. Meanwhile, the investors, employees and product consumers of the enterprise may lose trust and loyalty to the products or services of the supply chain. Indirect losses include default losses, customer satisfaction, and loyalty, etc.

4. Enterprises to Deal with Enterprise Supply Chain Risk Measures under Major Public Emergencies

4.1. Scan the Risk of the Supply Chain Environment

Emergencies in the internal and external environment of the supply chain often occur, such as the snow and ice disaster in southern China in 2008, Wenchuan earthquake and so on. In the face of the risk of emergencies in the environment, can take the supply chain environment risk scanning way to deal with, by obtaining help to identify potential threats in the supply chain external environment information, to explain and predict the internal and external environment of the supply chain, to provide the basis for reduce supply chain risk decision and direction, reduce the impact of emergency events on the supply chain.

4.2. Coping with Demand Risk Strategies

After an emergency, when the market demand fluctuates with a sinusoidal function, the supply chain system is inevitably affected. In order to reduce the pressure of the supply chain system, the supply chain can meet the market demand, so the demand delay strategy can be adopted. Convading manufacturers' downstream corporate retailers to accept delayed products or services by adopting specific measures, such as price discounts, will help maintain the continuity of supply chain operations and win more buffer time for the recovery of the supply chain.

4.3. Coping with Supply Risk Strategies

After the delay of emergency delay of supply chain, supply chain members of the enterprise can adjust orders according to the control strategy to maintain the supply chain operations, to reduce the risk of emergency supplier supply failure, to ensure the stable supply of materials and products, can develop multiple supply channels in the supply chain, to spread the risk of supply chain failure.

4.4. Establish a Strategic Emergency Inventory Strategy

Whether the supply chain is disturbed by demand risk and supply risk respectively, or whether it is disturbed by these two risks simultaneously, it will directly affect the inventory of the supply chain. In view of this, the supply chain can adopt the strategy of establishing strategic emergency inventory to mitigate the risk caused by emergencies. It is not set for daily supply and demand fluctuations, but to deal with the risks posed by emergencies. When supply or demand fails, it enables enterprises to respond quickly to unexpected events and minimize losses by setting up a strategic emergency inventory within the enterprise. Company can establish strategic emergency inventory within the enterprise, after emergency, due to the supply process of the upstream supply chain or downstream supplier market demand in a short time, the company according to the control strategy to adjust the order, but if the supplier still can not meet the order, can call strategic emergency inventory, quickly supplement the downstream retailers order, so as to reduce the loss of upstream supply and downstream out of stock.

4.5. Establish a Flexible Information System Strategy

At present, although the supply chain has established an information system to realize the management of people, money and material, and the enterprise can operate effectively in normal conditions, once the information system fails in an emergency, it will directly affect the normal operation of the enterprise, and even cause the collapse of the whole supply chain. To mitigate the impact of such risks, strategies to establish flexible information systems can be adopted to reduce the impact of risk. This strategy is implemented by backing up the information system and its system data within a certain time period. When an emergency causes a lot of disturbances to the enterprise, the enterprise can timely obtain the relevant hardware, system and data, and quickly restore the system to ensure that the supply chain is quickly repaired to the normal operation state.

5. Conclusion and Outlook

This paper gives an overview of supply chain risk management under emergencies, but supply chain risk research, as an important research direction in the supply chain field, there are still many aspects that need further study.

5.1. At Present, The Empirical Research on Supply Chain Risk Analysis is Relatively Weak and Requires Further Research.

Supply chain risk and supply chain are inseparable from the uncertainty of supply chain, including very many risk factors, and supply chains of different structures may be disturbed by different risks. Through empirical research, the establishment of the database and knowledge base of supply chain risk, the measurement of supply chain risk factors through the combination of data mining and knowledge mining, and the identification of key risk factors. On the basis of a comprehensive analysis of the supply chain risk, the supply chain risk analysis in different situations should also be paid attention to.

5.2. The Impact of Emergencies on the Supply Chain is Infinite.

Due to its sudden and unpredictability, people often ignore its existence. Therefore, it is of great significance to study different types of emergencies according to different types of supply chains. Analyzing supply chain risks in various emergencies and developing corresponding risk control strategies are the focus of supply chain researchers.

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