

## Research on risk management of supply chain partners

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**Abstract.** The company rely on supply chain partners increases the risk of enterprise management, the cooperation of supply chain risk management is an important part of the supply chain partnership. Therefore, has a strong theoretical and practical significance to study on partnership of supply chain risk management. This paper aims to explore the supply chain partnership from the perspective of risk prevention, research situation of partners in supply chain risk and supply chain in China partnership development present situation, and help enterprises to use the confidence building mechanism, control dynamic contract, establish effective incentive and distribution of interests mechanism, promote cultural fusion methods such as risk aversion the development of enterprises in the supply chain, to achieve healthy, sustainable, stable.

**Keywords:** supply chain; cooperative partnership relations; risk; risk prevention.

### 1. Introduction

Since in twenty-first Century, due to the continuous development of science and technology, accelerate the progress and the economic globalization of information network and market formation and technological change, around the new product market competition is fierce day by day. Each big enterprise to actively participate in the international competition and negative stick to local markets will face the same opponents in the global scope, various resources including labor, raw materials, equipment, technology and market, in the global scope, will flow and balance. The new environment in the face of increasing global competition, user needs change rapidly, the market vary from minute to minute, enterprises set up for partnership and management, especially in the environment of supply chain management research and practice of partnership risk lack some degree of attention, enterprises generally inadequate. The problems mainly displays in: lack of supplier classification management, serious short-term behavior; partnership maintenance and the lack of risk awareness; partnership risk decision-making and lack of reasonable basis. Especially in the circumstances of the global economic crisis, it is particularly important to establish and maintain a good relationship is. Through this economic disaster so as to powerful guarantee enterprise normal stable.

The maintenance and development of the supply chain partners, must cultivate the enterprise corresponding risk awareness, using scientific methods to cooperative risk analysis, judgment, positioning, make its risk attributes more clear, so that enterprises in the cooperative decision-making more scientific, so that the risk prevention measures have a definite object in view, effectively safeguarding the supply chain enterprises interest. Supply chain management is the management of the flow of goods, capital, information composition in suppliers and manufacturers, distributors and customers in the network. The core of supply chain management is to supply as a starting point, connect production, circulation until the consumer terminal, the implementation of effective organization and management. Supply chain partnership is the supply chain organization form; risk of supply chain cooperative partnership is an important part of supply chain management. Between suppliers, manufacturers, distributors and customers, if because of the risk factors that affect the partner relations, would be impossible to reach effective cooperation, it is difficult to further improve the ability of enterprises to respond quickly to market changes, is also very difficult to win the competitive advantage in the international and domestic market.

## **2. Analysis and risk status of the establishment of the domestic supply chain partnership**

### **2.1 Domestic supply chain partnership established status**

China's enterprises to establish a cooperative partnership of stem and management, especially in the environment of supply chain management of partnership risk research and practice started late, the enterprise attention degree is generally insufficient. But, out of the need of management and control, and most manufacturers of raw materials, semi-finished products or parts suppliers formed a kind of ownership or are in a relationship of adversary, such a relationship between supplier manufacturer is large and complex, even in the two sides have established long cooperation relationship in the case of, because the market and environment and interests, morality and other reasons often cause partners perfidy, pose a threat to the supply chain. The new environment in the face of increasing global competition, the user's needs change rapidly and fast changing market, enterprises in China exposed many problems and defects in the cooperation, mainly displays in: the lack of supplier classification management, serious short-term behavior. At present the majority of domestic enterprises to all suppliers are managed equally, which occupies a large number of Enterprises Limited management resources, and because the management goal is not clear and difficult to focus on the implementation of effective management of the important suppliers, caused between the enterprise and the supplier is unable to form a true partnership, make the supply chain inefficiencies, partners in name only.

### **2.2 The present situation of domestic supply chain risk cooperation partner**

People talk about the cooperation of supply chain, always first thought of economy of scale generated by the collaboration and synergy value may be insufficient understanding of the importance of cooperation the risk and risk management. The rapid development of supply chain technology brings great changes to the enterprise supply chain management, especially the application of information technology in supply chain management requires a powerful entity of the network and information network as the basis, so that enterprises in the efficiency increases at the same time will also increase the risk, as an important core supply chain management, maintenance and develop the partnership also bear a great risk, but the enterprise often to such cooperation between the lack of risk awareness, there is no corresponding preventive measures.

At present, enterprises and suppliers to establish relations of cooperation is often limited to product supply relations, the lack of supply chain management humanization necessary on the one hand, on the other hand, the side often according to the product price and cost will decide whether to cooperate, and ignores the other risk cooperation middle students, such as, the invisible loss the image of the enterprise moral loss. Especially for strategic partners, due to its importance to provide supplies, in the cooperation between enterprises is difficult to judge whether to continue on. In addition, at the height of the close cooperation relations, one party to the other party's breach of trust often caused serious damage, and this breach of trust in addition to the market, policy, information factors, often there is moral, the issue of capacity, the potential risk of property is difficult to grasp, the enterprise in decision making on the lack of a more comprehensive decision on the basis of. Therefore, the maintenance and development of the partners, in view of the present situation of enterprises in our country, the enterprise must cultivate the corresponding risk awareness, using scientific methods to distinguish risk. So that enterprises in the cooperative decision-making more scientific, so that the risk prevention measures have a definite object in view, a powerful maintenance supply chain profit.

## **3. Partners in supply chain risk identification**

In the fierce market competition, enterprises must have a full understanding of the effect of all kinds of risks of supply chain partners operate their own performance, and the control and management of comprehensive. How to correctly identify and analyze all kinds of risk factors of supply chain partnership is the basis and premise of the risk management. Risk identification is the basis of risk management, not through the identification, application of language symbols to express

the risk, will not be able to measure and manage risk. Risk identification of supply chain partnership, refers to the system understanding and analysis through a large number of data, make clear the various risk factors of supply chain partnership, and then determine the risk and the nature of the enterprises in the supply chain partners face, grasp the law of development.

### **3.1 Supply chain partnership risk identification significance**

Risk identification is the first step to manage the risks effectively. There is no risk identification; there is no risk prevention and risk control. Risk factors of supply chain partner recognition are a prerequisite for cooperative partners in supply chain risk management, have very important significance. No matter from the theoretical perspective, or from the practical, generalized any associated with the cooperation of supply chain risk factors are likely to affect the performance of the supply chain cooperation risk, and then lead to the occurrence of partners in supply chain risk. However, not all factors will have significant influence on the performance of supply chain cooperation risk. Therefore, the key risk factors identification is to identify those who have significant influence on the cooperation of supply chain risk of sustained and stable operation and performance, the key risk factors could lead to insufficient cooperation of supply chain risk management objectives and even cause the supply chain cooperative risk of disintegration.

Generally speaking, the most effective treatment of risk factors of the stage is early recognition, although not all of the risk in supply chain cooperation risk construction phase occurs, it is to consider all kinds of risk factors in period. Obviously, the risk identification should as far as possible in the construction of the cooperation risk in supply chain start. If we wait until the risk event occurs, then take control action, operation effect on supply chain cooperation risk is bigger. Early identification of partners in supply chain risk is for the partners in supply chain risk management policy and strategy, especially through the cooperation of supply chain risk identification risk can further improve the cooperation of supply chain risk management, reduce the risk and cost, and improve the operation stability and safety. Furthermore, by this stage of the work, can for the future planned treatment prevention and control risk to prevent the cooperation of supply chain risk of rupture and failure, minimize risk identification in early to do well, and provides the basis of efficient operation and safety running continuously for the cooperation of supply chain risk. If the potential risk in the supply chain partner stage of identifying risk factors failed to identify will be excluded from subsequent analysis of partners in supply chain risk management, of partners in supply chain risk factors identification is appropriate or not, the recognition result is accurate or not will further influence the supply chain partnership risk analysis and risk management process. Supply chain partners to identify risk factors is not comprehensive and not accurate, will go directly to the subsequent risk estimation and evaluation bring deviation, thus the proposed cooperative partners in supply chain risk management measures will not mitigate losses to.

### **3.2 Method of supply chain partnership of risk identification**

Supply chain partnership risk factors faced in cooperation of the supply chain from the internal and external environment, risks arising from the process of cooperation, is mainly considered from every node in supply chain cooperation risk network and mutual connection, clear all potential risk factors and uncertainties. The first series of events generated in risk identification risk. It should use of causal relation method to look for the risk events, recognition of the extent of its influence. Therefore, once the cooperation of supply chain risk identification risk events, must analyze the reasons and background of these events may consider. A risk event may have several potential occurrences of factors, and must affect the identification of each factors, a risk factor is a characteristic of the most significant risk, from the management point of view, the most important aspect of risk, is the cause, only through the effect of control of these reasons to early warning of risk management.

There are several common methods of risk identification:

#### **(1) Risk checklist**

The risk identification process, experienced management personnel in the brain can think of many kinds of possible risk factors. The experienced risk events and can be expected to list factors, after finishing the formation of a risk checklist. Risk checklist is sorting out the risk of historical data and

to study the risk factors of the results. Through the risk checklist to fully organize the scattered clues systematic discussions and exchanges, as a tool, as risk control tool.

(2) The supply chain operations reference model

SCOR is the American Association of supply chain design and implementation of a specialized for supply chain description and design tools that can be used as a supply chain risk identification tool. Using the SCOR model to the entire supply chain structure, composition, geographical distribution, process clearly described, risk managers can careful analysis of environmental risk, supply chain risk may face the risk, the behavior of the main structure, can go deep into the cost risk, time risk and quality risk of each layer subdivision process identification of supply chain process the. The SCOR model is designed for the statistics of each level of supply chain and supply chain operation of expected index prediction, the possibility of a predetermined index is the risk factor, influence the realization of predetermined index is the risk factor is not up, index relatively poor link is the weak link in the risk management. With the help of SCOR model identification of supply chain risk, can facilitate the analysis and comparison of supply chain reengineering risk assessment before and after the change of state, effects of process reengineering on the reliability of supply chain.

(3) Causality diagram

Causality diagram is also known as the fishbone diagram, is likely to cause by graphic method will cause a result list and classification tools. Many potential reasons can be summarized into classification and sub causes, draw out the form similar to the fishbone like. Causal diagram usually and brainstorming method combined with the method of brainstorming, to collect all the possible causes, and then summarize them into categories and sub causes reason. Causality diagram is a good tool for representing causality, causality is also very good analysis tool, according to the results of identification, analysis of the causes of symptoms, demand strategy. Causality diagram is a traditional method, but also the practical cooperative partners in supply chain risk identification tool.

(4) The fault tree

Fault tree is a way to express a causal graph, the result is a system failure or risk events, according to the fault reverse search may cause. Fault tree is based on logic diagram form reflect partial failure of a series of how to cause the overall fault. According to the fault tree provides information to analyze qualitatively the factors leading to the partners in supply chain risk, can further to take measures to improve the reliability of supply chain partnership. According to the basic events of the minimum cut set of combination, the logic relation between basic events, the basic event probability, quantitative calculation of risk likelihood.

(5) The Delphic method

The Delphi method has become the expert investigation method, it is mainly based on the intuitive ability of experts to identify the risk, namely through investigation opinions gradually concentrated, until at some level to reach an agreement, it is also known as the expert opinion focused method. Because of the need for repeated collection and feedback opinion survey, using Delphi method for identification of partners in supply chain risk will continue for some time. Therefore, this method is more suitable to allow longer preparation period, the comprehensive identification of the existing supply chain partnership risk. The method comprises the following steps: preparation of supply chain risk factor checklist; composed of partners in supply chain risk management expert group; consulting expert opinion; collect the opinion of expert group; determine anonymous feedback form or risk identification conclusion. This study on the basis of literature research, combining with the practice of enterprise management, enterprise experience, and interview and questionnaire survey was conducted to identify risk factors of supply chain partnership.

#### 4. Supply chain partnership risk prevention measures

#### 4.1 The establishment of trust mechanism

To establish a trust relationship has tremendous simulative effect to strengthen the cooperation between enterprises in the supply chain: can reduce the transaction costs between enterprises, reduce the agency problem between enterprises, reduce the incentive and supervision is not necessary; can enhance the cooperation between enterprises will, improve production and service flexibility, in the unpredictable events occur improve their sense of responsibility and sense of trust in each other, trying to seek the common interests of both sides; can improve the quick response ability of the whole supply chain.

For the supply chain cooperation between the two sides, should take repeated game strategies, enhance the long-term cooperation, reduce risk, between enterprises in supply chain, and through the signal transmission to obtain understanding and trust of the client, to achieve the equilibrium of game appear. Coming from a long-term view, only repeated game produced the result of cooperation, forming a strategic partnership between enterprises in supply chain, truly achieve the supply chain management mode of "win-win".

To establish the information sharing mechanism, timely communication of information is the effective measures to prevent the cooperation risk. Supply chain management to a high degree of information set as the background, the non-symmetry information occurs when after signing the contract, the risk of moral hazard can result. Not fully inter enterprise supply chain information, not only affect the correctness of all enterprises in the supply chain decision, also will cause the crisis of confidence between the two sides, the existence and development of the relationship between hinder cooperation. Therefore, in the supply chain management among supply chain enterprises must improve the information exchange level, make full use of modern means, to realize the network, the exchange of information between enterprises, horizontal, institutionalization, standardization, flexibility and security, so that the enterprises can be flexible, can be operated timely information resources, fully grasp the cooperation product related information, among supply chain enterprises market information, make the enterprise can from the global supply chain starting to arrange production and service, and effectively prevent the adverse selection in the process of cooperation and immoral behavior, establish an information sharing system, the supply chain partners of mutual trust relationship can be established.

#### 4.2 Control of dynamic contract

Dynamic contract also called flexible contract, is a kind of the risk prevention, dynamic, flexibility of the contract system, the system can overcome the one-off contract not easily according to the actual implementation of the change and too rigid weakness. The characteristics of dynamic contract system have dynamic and three-dimensional. From the "dynamic" point of view, on the one hand, the different stages of cooperation in supply chain enterprises adopt different forms of contract, in order to prevent the risk; on the other hand, the establishment of dynamic inspection mechanism, the timely discovery and risk aversion. From the "three-dimensional" perspective, different partner types can use dynamic contract in different forms in different stages, and also with the cooperation mechanism of risk inspection stage of development and change.

##### (1) Signed a dynamic contract

One is the different stages according to the supply chain cooperation (cooperation, cooperation, cooperation in early middle late etc.) risk status, and consider different partner types (general partner, bottleneck partners, an important partner, strategic cooperation partners), take a different form of contract (market price, cost plus fixed fee contract, cost plus incentive fee contract, cost plus incentive fee contract, fixed price contract, the fixed price incentive contract). Two is to provide some change according to the market situation and contracts depending on progress flexibility in terms of the contract content.

##### (2) The establishment of dynamic checking mechanism

To examine the different stages of enterprise in the supply chain cooperation progress, and according to the inspection results to decide whether to implement the next phase of the contract, the contract is in stages, thereby reducing disposable contract brings funding secure risk. By examining the core enterprise incentive mechanism of cooperative enterprises faithfully disclose the progress of

business, reassess its when necessary, to decide whether to continue to cooperate, which may decrease the loss to a minimum.

#### **4.3 To establish an effective incentive and distribution of interests mechanism**

In the environment of supply chain management, any supply chain node enterprises operating performance is good or bad, is not only related to their own survival and development, but also related to the supply chain business and the interests of the whole supply chain competitiveness. And the formulation of standards of supply chain performance evaluation assessment of scientific, reasonable and the formation of the corresponding incentive and distribution of interests mechanism, not only conducive to the formation of between the supply chain relationship between the restriction and supervision, to ensure the effective operation of the supply chain, but also inspire all supply chain partners in the enthusiasm, initiative and creativity, and timely discover a problem, solve the problem in time, each enterprise in supply chain to promote top-notch performance, to improve the whole supply chain competition ability and economic benefit. The means of incentive in supply chain management mainly has the price incentive, incentive, and incentive, order information of new products and technology development incentive, incentive, incentive out of goodwill. Under the environment of supply chain, the distribution of benefits between the partners in supply chain each mainly reflected in prices, the price includes supply chain to achieve profits and supply chain optimization and generate additional income or cost allocation between enterprises and balance. Establish stable between for supply chain partnerships price allocation and incentive mechanism of scientific, reasonable and effective, beneficial to the entire supply chain run smoothly. The elimination of incentives aimed at a crisis to drive the mechanism formation of supply chain system, let all cooperative enterprises have a sense of crisis, the node enterprises in the supply chain in order to obtain the group advantages in supply chain management system at the same time he also obtained the development, we must assume certain responsibilities and obligations, and bear the corresponding risk. And information incentive, incentive, orders for the new product and technology development incentive and goodwill motivation, help to eliminate the opportunism behavior of cooperation of supply chain caused by the information asymmetry in the resulting cooperation, reduce risk; promote the member enterprises to improve product quality and working efficiency, and actively develop new products, new technology and new process; to promote close cooperation between enterprises, from the benefit mechanism induce and encourage enterprises and the whole supply chain share a common fate, and the supply chain's overall objectives and operational pace consistent, achieve supply chain efficiency to achieve shared interests and the overall optimization.

#### **4.4 Promote cultural fusion**

Promote the integration of enterprise culture in the supply chain partners, to eliminate differences in information and knowledge, causes the enterprise goals tend to be consistent, is a necessary condition for effective cooperation between supply chain partners and efficient operation of the supply chain. One is to establish a shared vision, shared values, management philosophy and culture concept. Between the partners in the cooperation of mutual learning, mutual integration in learning, promote each other in the fusion, in order to the common goal of unity and cooperation, common development. Two is to strengthen the cultural training, establishing win-win cooperation concept. Cultural training is to solve the cultural conflict, the realization of one of the effective ways of culture coordination. Three is to carry out regular communication and information exchanges. The members of the supply chain partners to overcome the language, habits, values, ways of thinking obstacles, multi-level, multi-channel, three-dimensional, high frequency communication and information exchanges, promote cultural integration. The four is to establish the harmonious interpersonal relationship. Cooperation agreement of any supply chain cannot be a seamless heavenly robe, watertight, implementation of the agreement, will face many uncertainties and conflicts of interest, which requires the cooperation of enterprises and related personnel from the overall situation, Honest and trustworthy, mutual tolerance, understanding each other, strengthen communication, enhance trust, to create a harmonious Humanities environment and cooperative atmosphere. The five is the importance of informal organizations in the role of cultural fusion. In some cases, informal organization for the dissemination of culture and information efficiency even more than formal

organization and informal organization to accept degree of cultural integration is directly influenced by the cultural fusion between formal organizations. So, should the cultural fusion in two aspects of formal organization and informal organization, and even can be first in the informal organization was to integrate into the cultural identity, the use of informal organization in the overall organizational efficiency of the system, which will promote culture fusion to the formal organization to.

## 5. Conclusions

Partnership in supply chain risk management is an important research content of partnerships in supply chain management, in the face of the complex relations of cooperation must be foreseeable risk factors and risk prevention of produce. In the prevention process of supply chain partnership risk, to reduce the risk to the minimum risks must be found as soon as possible. Therefore, using scientific and reasonable method for the identification of risk is a prerequisite for effective risk prevention. The supply chain cooperation hidden complex cooperation risk, take measures and methods of prevention, can effectively avoid the cooperation risk, enhance the overall competitiveness of the supply chain. Cooperation risk prevention is a complex systems engineering, the construction of early warning system, emergency plan design and risk sharing scheme implementation, need to be further studied.

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