

Research on single-source procurement strategy of multinational manufacturers

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Abstract

With the deepening of economic globalization and the continuous breakthrough of artificial intelligence technology, the expansion of supply chain systems around the world has become an irreversible trend of the times. Compared with the traditional supply chain, the global supply chain can reduce production costs, improve production efficiency, and stimulate economic growth. However, due to the flow of information, business and capital between supply chains, it has certain vulnerabilities. With the increase of supply chain members and the extension of the chain, the risks it faces are also increasing day by day. In recent years, the trend of US trade protection and anti-globalization has intensified, and the new crown pneumonia epidemic has continued to spread around the world, which has caused huge losses to my country's manufacturing industry. Based on this realistic background, this paper studies the procurement strategy of my country's multinational manufacturers.

Keywords

Manufacturer; Purchasing; Strategy.

1. Introduction

Since the reform and opening up, my country's economic development has made remarkable achievements, and the volume of foreign trade has also increased year by year. As of 2018, my country's total export commodities reached 2,487 billion US dollars. Compared with 1980, the total export volume increased by nearly 138 times, making it the world's largest exporter. Behind this proud achievement, the manufacturing industry has made a huge contribution. As a big manufacturing country, my country has a high proportion of manufacturing exports in the total export volume of goods for many years, which shows that the manufacturing industry plays a pivotal role.

However, in recent years, my country's manufacturing-related enterprises have encountered many obstacles in their development. On the one hand, US trade protectionism is on the rise, and it has continuously adopted measures such as increasing tariffs and anti-dumping on my country's import and export commodities to hinder my country's development, and even imposed technical blockades on my country in high-tech fields such as lithography machines and chips. Seriously disrupted the world trading system and hindered the normal operation of supply chains. On the other hand, there is a new type of coronavirus pneumonia (hereinafter referred to as new coronary pneumonia) that suddenly appeared at the end of 2019. As of February 18, 2022, the number of confirmed cases worldwide has exceeded 400 million, and the number of deaths has exceeded 5 million. The new crown pneumonia epidemic has caused global factory shutdowns, material shortages and logistics stagnation, affecting the business development of supply chain companies, causing disruptions to the global supply chain[1], and the impact on my country's manufacturing industry is even greater.

Chinese is not only undergoing supply-side reform, but after decades of development, my country has the most complete modern industrial system in the world [2]. Since the founding of the People's Republic of China in 1949, my country's total industrial economy has continuously moved to a new level. As of 2018, my country's added value has exceeded 3 billion yuan. In 2017, the added value of my country's manufacturing industry accounted for 27% of the world's total, and more than half of the world's steel production , cement and computers are all manufactured in my country. At present, my country has developed into the only country in the world that has all the industrial categories in the United Nations Industrial Classification. At the same time, party organizations at all levels led the majority of party members and the people to fight the epidemic, which brought the domestic epidemic under control, and the economy also achieved positive growth in the second quarter of 2020. The basic conditions for a new dual-cycle development pattern have been met. In this context, the CPC Central Committee with General Secretary Xi Jinping at the core proposed a new development pattern of "Dual Circulation", which should "gradually form a new development pattern with domestic circulation as the main body and build a domestic and international dual circulation mutual promotion". The 2020 Gasgoo Consulting report pointed out that less than a quarter of the respondents' companies' key core components accounted for more than 50%, but more than 70% of the respondents said that their company The procurement of overseas parts will be gradually reduced. In addition, after years of development, the eastern coastal area of my country has become an area with relatively complete industrial clusters. Therefore, its industrial clusters can be used to strengthen local supply capabilities and reduce the problem of supply interruptions caused by epidemics or trade frictions. However, although my country's manufacturing industry already has certain conditions, it is a question worthy of research on how multinational manufacturers can do a good job of "internal circulation" under the new development pattern of "dual circulation" and reduce supply chain-related risks.

2. Manufacturer's decision optimization under single-source procurement

2.1. Model analysis

Now suppose that there is a supplier and a manufacturer in the supply chain, the market demand is D , but the demand is uncertain. When the market demand is high, the market demand is D^H , and the probability of occurrence is θ . When the market demand is low, the market demand is D^L . The probability is $1-\theta$. The manufacturer purchases raw materials from the supplier in quantities of Q .

2.2. Numerical simulation

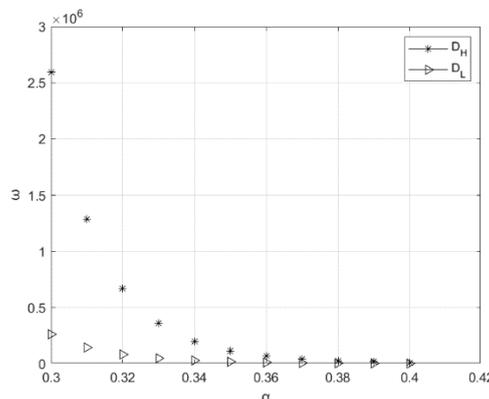


Figure 1 Changes in decision variables

3. Literature References

At present, most of the research on the manufacturing industry under the background of "dual circulation" is conducted by domestic scholars, and foreign scholars are rarely involved. Jie Xiaowen and Ning Shengnan considered "dual circulation" while taking into account green development. They analyzed the green international competitiveness of China's small and medium-sized manufacturing enterprises and believed that China's manufacturing industry not only needs to improve the ability of independent innovation, but also needs to improve the greenness of products. Value and building a green innovation platform[3]; Huang Lifang and Wu Fuxiang[4] analyzed the characteristics of China's manufacturing industry using China's customs data and WIOT data since China entered the World Trade Organization, and believed that China's manufacturing industry needs to further develop talent, technology and Increase investment in the system; Zhou Kaige and Zhuang Ning[5] believe that in the case of insufficient basic technology and lack of key technologies in China's manufacturing industry, it is not only necessary to strengthen cooperation and innovation through globalization, but also to stimulate demand through the establishment of an internal circulation platform. ; Lin Bing et al. [6] proposed a new dual supply chain model for China's multinational manufacturers based on China's development strategy, through existing research and the principle of risk sharing; Ma Dan et al. [7]based on macro and micro perspectives. China's manufacturing industry has carried out research and found that Chinese enterprises are in the predicament of chain length and profit in the global value chain, and they are faced with the double "low-end lock" risk of the bottom lock in the chain of the value chain curve and the overall downward movement of the chain segment. The dual division of labor between domestic and foreign dual cycles can make China's manufacturing industry out of the "low-end lock-in" dilemma; Xu Wenge [8] believes that China's manufacturing industry still has many areas of weakness, and investment in manufacturing will provide industrial upgrading support for dual cycles; Zhou Kaige et al[9] believe that although China has established the world's largest and most extensive manufacturing system, the manufacturing industry still has deficiencies in technology and quality. Advice on how to transition in a circular context.

With the development of economy and technology, people's quality of life has been greatly improved. Whether it is shopping online, daily travel entertainment, or even going to the hospital for treatment, people are enjoying convenient and efficient life services all the time. And these efficient and convenient production may all depend on the smooth operation of the huge and complicated supply chain. Due to the close connection between upstream and downstream enterprises in the supply chain, there is the exchange of logistics, information flow, and capital flow, so the supply chain is vulnerable [10]; in recent years, the deepening of economic globalization and the advent of the era of intelligence and digitalization The supply chain has reached an unprecedented scale and unimaginable complexity[11], so the risks faced by the supply chain are also increasing.

There are many risks faced by the supply chain, so there are different classifications of supply chain risks. For example, Mason and Towill [12] divided supply chain risk into natural environment risk, supply risk, demand risk, supply chain process risk and control risk; Wagner and Bode [13] pointed out that supply chain risk has internal and external risks, supply chain risk The internal risks of the supply chain are supply risks and demand risks, which are mainly caused by the relationship between supply and demand within the supply chain. The external risks of the supply chain are regulatory legal risks, infrastructure risks and catastrophic risks. The external risks of the supply chain are not caused by internal factors in the supply chain. It is mainly caused by external factors; Kleindorfer and Saad [14] further divide supply chain risks into two categories: risks caused by internal factors such as production equipment failures and

business strategies, and external factors such as politics, terrorist activities, or earthquakes and tsunamis. risk arising.

4. Summary

With the turbulence of the world political situation and the frequent occurrence of various disasters, supply chain risks are also increasing day by day. Based on the new development pattern of "dual circulation", this paper studies the procurement strategies of multinational manufacturers. It is found that if the supplier's production elasticity coefficient is low, when the technological elasticity coefficient increases, the contract price and supply chain risk will also increase; and when the supplier's production elasticity is high, the greater the technological elasticity coefficient, the lower the contract price. Therefore, suppliers should pay attention to the improvement of their own elasticity coefficient to provide protection for the supply chain to reduce risks.

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