

# **RESEARCH OF THE FINANCIAL EARLY WARNING MODEL OF LISTD LOGISITICS ENTERPRISES IN CHINA**

## **1. INTRODUCTION**

### **1. 1 Background introduction**

Under the circumstance of domestic market economy of the increasingly fierce competition, based on the background of the globalization, financial risk is the one that any companies can't avoid and have to face, always accompanying the life cycles of companies. Financial risks exist objectively in all aspects of the company's production and operation. There are always various financial risks from the financing to the procurement, from the production to the sales, and from the investment to the dividend distribution etc. Risk can not be completely avoided, as long as the company is still running; there are various risks that threat the company's main body. Moreover, the existence of a company takes the creation of value and profitability as its most basic goal and it won't end its own production activities and development needs only to avoid risks. Therefore, to meet the production and operation of companies, the problems on how to make efforts to avoid risks and, reasonably control the potential risks, should be attached great importance by entrepreneurs and scholars.

The development of modern logistics is not only an economic revolution. From the perspective of essence, what the most important is that it also plays a role of "fire" and "accelerator" for modern economic development. With the development of coordinated development in regions and increasingly improvement in industrial division and cooperation, and the continuous enhancement of the socialization and professionalization of production, the modern logistics industry has gradually been widely regarded at another important source of profits after reducing material consumption and increasing labor productivity, and gradually becoming an important basic service industry in the national economic system. On the basis of time, the modern logistics industry can reduce delays in the elimination of delays, and can reduce inventory overstock and out of stock of other industries, speed up the production and the circulation, and also optimize economic process through eliminating the delay and postpone. From the perspective of space, it can

achieve the effective connection between the place of production and consumption of material products, and it can optimize the allocation of resources and industrial structure, promote the efficient and coordinated development of related industries to improve the quality of economic operation and improve the quality of economic operations. Specifically speaking, the function values of the modern logistics, as a value-added activity in social and economic production, include: time effectiveness, space benefit, value-added service benefit, and integration benefit, such four main aspects. However, whether it's the manners of operation or organizational structure, logistics companies have obvious differences from traditional enterprises. For the diversified structures, the diversified mode of operation of modern logistics companies and its construction are similar to the traditional companies, meeting and financial warning model of needs and the features of era , helping them avoid or resolving possible financial crisis that possibly happen, which will have greatly significant practical significance and historical value.

For companies, it's not just a verbal word to avoid risks. What it requires companies to do is that companies have to improve their awareness of prevention, enhance their professional technical capabilities, optimize management, and improve the quality of financial management. It is impossible to completely avoid risks, but it is not uncontrollable. In order to reduce the financial risks of logistics companies, the first task is to start from the management level. Scientific management is a theory of management that analyzes and synthesizes workflows. Its main objective is improving economic efficiency, especially labour productivity. It was one of the earliest attempts to apply science to the engineering of processes and to management. Scientific management is sometimes known as Taylor's after its founder, Frederick Winslow Taylor. Taylor began the theory's development in the United States during the 1880s and '90s within manufacturing industries, especially steel. Its peak of influence came in the 1910s; In 1913 Vladimir Lenin wrote that the "most widely discussed topic today in Europe, and to some extent in Russia, is the 'system' of the American engineer, Frederick Taylor"; Lenin decried it initially as a "'scientific' system of sweating" more work from laborers. Taylor died in 1915 and by the 1920s; scientific management was still influential but had entered into competition and syncretism with opposing or complementary ideas. Although scientific management as a distinct theory or school of thought was obsolete by the 1930s, most of its themes are still important parts of industrial engineering and management today. These include: analysis; synthesis; logic; rationality; empiricism; work ethic; efficiency and elimination of waste; standardization of best practices; disdain for tradition preserved merely for its own sake or to protect the social status of particular workers with particular skill sets; the transformation of craft production into mass production; and knowledge transfer between workers and from workers into tools, processes, and documentation, financial management is at the core of each management. Funds are the blood and life of an

enterprise (Wikipedia, 2018). All actions of the enterprise will ultimately be reflected in the financial aspect; therefore, the ultimate purpose of a company is to obtain benefits. Therefore, enterprises should think of their own financial management as their top priority, and attach importance to various phenomenon that exists in the financial management, and establish a defense of financial early warnings so that enterprises can take preventive measures and avoid all unfavorable elements that are not beneficial to the development of enterprises, which should be an important task that enterprises should make efforts and do well in the current situation.

## **1. 2 The purpose and significance of the Research**

### **1. 2. 1 Purpose of the research**

The construction of financial warning system in a company is a kind of enterprise management technology regarded as mainstream by academic fields at home and abroad, and has been attached great importance from the business community. The so-called early warning of financial risks begins with the company's financial data and it can discover various issues that are reflected in the business operations. The finance of company is like a cell of a company, spreading throughout the company's entire body and various problems are truly reflected in the financial information of the company. If we design the indexes that can perfectly reflect the major issues of the company as a certain standard, it can remind the decision makers of their vigilance and adopt effective countermeasures as soon as possible so that it will not accumulate over time causing the accumulation of the problems, in the end, the problems are created greater and there is no any solution to solve. In addition, whether it's the investor, the debtor or partners, major customers or even of a company, major customers, and even the government who is in charge of the companies, all of them hope to clear out the truly operational situation of companies through the financial report, which all shows that the construction of financial warning system which is a scientific, reliable, and suitable for the actual situation of the company is very important. At present, due to the background of company, the circumstance of a company facing and different management cultures of companies, it is necessary to do a lot of research work to establish a financial warning system that is truly suitable for companies, and it takes time to observe the applicability of the early warning system. The complex international and domestic economic environment has forced senior executives of enterprises to pay attention to this work and prepare for risk prevention ahead of schedule.

### **1. 2. 2 The Significance of Research**

The paper aims to build an early warning model that is capable of reflecting market conditions for Chinese logistics companies. The main objectives are as follows:

(1) Reduce the significance of logistics companies and management costs, improve operational efficiency and risk aversion, and identify problems in business operations in a timely manner. Compared with general industrial enterprises, logistics enterprises have to bear a lot of transportation and warehousing costs, and logistics companies have the characteristics, such as many business outlets, large business volume, a great number of fixed customers, and small single- business operations, etc and all of these production activities have increased the total cost the company. Increasing the difficulty of the cost management. Therefore, taking the early-warning model as an auxiliary tool for financial management can greatly shorten the time for the management mistakes and can timely and accurate deal the defects in financial management.

(2) Providing financial institutions with corporate reputation and debt paying ability for reference to avoid the occurrence of illegal accounts no other non-performing loans. Logistics companies face greater financial risks in both financing and investment. The average level of financing of logistics companies is greater than other industries, especially in the operational projects arising from transportation and warehousing, the debt paying ability of enterprises directly relates to whether the finance is safe. Due to the high capital investment which can low down the liquidity of the company's capital, it results in short-term production and the shortages of operating capital, greatly increasing the probability of financial risks. Therefore, it is of great significance to adopt financial early-warning models to assist companies in improving their credit ratings and optimizing their capital structure, as well as improving their debt paying ability.

(3) Providing analysis tools which can improve the development status of companies for government departments and providing scientific and objective reference theories for the formulation of macro policies and micro policies and the logistics industry is one of the important industries of the national economy, in addition, the fluctuation of the macro environment will certainly have influence on the development of the logistics industry. In turn, the overall trend of the logistics industry will also affect the changes of the macroeconomic environment to some extent. Therefore, it is rather necessary to establish a reasonable fiscal policy and stabilize the long-term development of the entire industry by means of having good command of the financial status of the industry.

(4) Provide accurate reference for investors and shareholders, and make reasonable investments to avoid unnecessary losses. The asymmetry of information and the lack of professional quality of middle and small-sized shareholders are the main causes of blind investment. Using more intuitive analysis results provides small-sized shareholders with reference opinions of investment risk, which is helpful to small-sized shareholders and investors to invest rationally.

## **1. 3 Introduction of logistics industry**

### **1. 3. 1 Overview of logistics industry**

Logistics is generally the detailed organization and implementation of a complex operation. In a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The resources managed in logistics can include physical items such as food, materials, animals, equipment, and liquids; as well as abstract items, such as time and information. The logistics of physical items usually involves the integration of information flow, materials handling, production, packaging, inventory, transportation, warehousing, and often security. In military science, logistics is concerned with maintaining army supply lines while disrupting those of the enemy, since an armed force without resources and transportation is defenseless. Military logistics was already practiced in the ancient world and as modern military have a significant need for logistics solutions, advanced implementations have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed. Logistics management is the part of supply chain management that plans, implements, and controls the efficient, effective forward, and reverses flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. The complexity of logistics can be modeled, analyzed, visualized, and optimized by dedicated simulation software. The minimization of the use of resources is a common motivation in all logistics fields. A professional working in the field of logistics management is called a logistician (Wikipedia, 2018). The term "logistics" first came from the United Kingdom in 1918, and Lord Hame of the United Kingdom in Juniliver established the "Real-time Delivery Co., Ltd." to deliver goods to wholesalers, retailers and users in a timely manner throughout the country. During World War II, the United States began with military needs. In the wartime supply of arms, the term "logistics management" was first adopted, and the arms transportation, supply, and garrison were comprehensively managed. After the Second World War, the word "logistics" was used by Americans in business management and was called "corporate logistics." Corporate logistics refers to the comprehensive management of the company's supply, sales, transportation, storage and other activities.

In the "China National Standard Logistics Terminology of the People's Republic of China" formally implemented on August 1, 2001 in mainland China, the definition of logistics has been defined, that is, the process of physical flow from the place of supply to the place of receipt. According to actual needs, the basic functions of transportation, storage, handling, handling, packaging, distribution processing, distribution, and information processing are organically combined. "There are five main factors in the evaluation of logistics systems: quality, quantity, time, location and price. Quality means

that the quality of materials remains unchanged during the logistics process. The quantity refers to the quantity requirements that are in line with the economy and the full-loading of transportation in transportation activities. Time refers to the principle of reasonable cost, timely delivery, and safety and speed. The location refers to the selection of a reasonable consignment and warehouse, avoiding two invalid transportations and multiple transshipments. The price refers to reducing logistics costs as much as possible while ensuring quality and meeting time requirements. On February 25, 2009, the logistics industry became a meeting of the Standing Committee of the State Council to review and in principle pass the tenth industry in the revitalization plan for the top ten industries.

With the development of modern economy and society, the arrival of the Internet era and the rise of e-commerce, more and more people have discovered and valued the value of logistics. The logistics industry is known as the “third profit source” by the industry and is called “the largest industry in the century” by the media body. First, the logistics industry is a complex industry. The logistics industry refers to a complex or converged industry formed by the industrialization of logistics resources. Logistics resources include transportation, warehousing, loading and unloading, handling, packaging, distribution processing, distribution, and information platforms. Transportation includes railways, highways, water transport, aviation, and pipelines. The industrialization of these resources has formed the transportation industry, warehousing industry, loading and unloading industry, packaging industry, processing and distribution industry, and logistics information industry. These resources are scattered in many fields, including manufacturing, agriculture, and circulation. The integration of industrialized logistics resources forms a new logistics service industry. This is a complex industry, it can also be called a converged industry, because the logistics resources of all industries are not simply superimposed, but through optimization and integration, they can achieve  $1+1>2$  effectiveness. Second, the logistics industry is a producer service industry. The productive service industry refers to the industries that provide services for the physical production and service production of the primary, secondary, and tertiary industries.

According to the rules of the industry classification guidelines for listed companies revised by the China Securities Regulatory Commission in 2012, although the logistics industry has not been separately listed as an independent industry, with the development of economic globalization and the rise of the Internet economy, it is believed that the revision of new industry classification guidance rules is also a matter of time. The logistics industry is classified under the transportation, warehousing and postal industry, and the leasing and business services industry. Among them, the industrial catalogs involving the logistics industry under the industry directory of transportation, warehousing and postal industry include road transportation industry, water

transportation industry, loading and unloading handling and other transportation agents, warehousing industry and postal industry. The industry directory involving the logistics industry under the Leasing and Business Services Industry Directory includes the leasing industry and the business services industry. In order to unify data collection standards in empirical research, this study uses the industry classification standards of the listed companies of the China Securities Regulatory Commission in 2012 as the scope of the logistics industry.

### 1. 3. 2 Causes of Financial Risks in the Logistics Industry

Whether it is the transportation, warehousing and postal industry or the logistics industry under the leasing and business services industry, it has the characteristics of large span, strong dynamics and high complexity. The particularity of the logistics industry, especially the logistics industry related to transportation, warehousing and postal industry, determines the specificity of its production and operation. The risks in the logistics industry mainly reflect the following points:

#### (1) Complex management methods increase financial management difficulty

The logistics industry often does not have stable customer objects and operating tools, and personnel flow frequently. Business cycle is uncertain. The variety of customer goods is complex and diverse. It can involve the rental, purchase of transportation tools and equipment. This makes the storage, management, classification, turnover, accounting and transaction of logistics enterprises' inventory, low value consumable and fixed assets all very important. If all links are not handled properly, it will not only cause confusion in their management, affect the production efficiency, but also cause excessive occupation and waste of corporate funds

The operating cycle of the logistics industry is relatively uncertain. In particular, logistics companies involved in transportation, warehousing and postal services often have large differences in their operating cycles depending on the services they provide. Affected by the uncertain cycle, construction companies are easily affected by factors that cannot be anticipated in advance, such as accidents of force majeure, accidents in the performance of contracts or approvals, indicators, etc. This greatly increases the operational risk of logistics companies. . In addition, in an indefinite production cycle, the geographical and time span is large, and the social production division of labor is strong. This requires that construction companies must have comprehensive production capabilities and all-round coordination capabilities.

#### (2) Mobility of logistics management process increases management costs

The mobility of logistics is mainly reflected in the mobility of large transport equipment and the mobility of technicians. Large transport equipment is an essential

production tool for logistics companies. It has the characteristics of large volume, high cost, repeated use, and frequent use. Its total transportation equipment is no less than some manufacturing companies. However, compared with ordinary manufacturing companies, construction companies need to bear the cost of maintenance and repair of large transport equipment, and also need to undertake the transportation and transfer of large transport equipment between different locations. This not only has a huge workload, it also affects the overall progress and increases the total cost. On the other hand, the logistics company is a very labor-intensive industry with high manual labor. It requires a large number of employees with production experience to invest in production and operation. Therefore, the flow and investment of human resources in logistics enterprises are relatively large.

### (3) Variability in business content and hard work environment

Logistics companies usually take on multiple businesses at the same time. Each business has a different work place and the operating conditions are more difficult and cumbersome than those of the general industry. These constraints have a relatively high requirement for employees' technical literacy. How to do a good job of human resources management should become an important part of the work preparation. In addition, some business locations may be in harsh environments with extreme cold or high fever. This will lead to disruption of the business cycle over a period of time, affecting the overall business progress and thus affecting the goodwill of the logistics company. This is also a link that logistics companies should pay special attention to.

### (4) Potential risks in financial markets increase corporate investment and financing risks

Logistics companies face greater financial risks in both financing and investment. The increase in the amount of financing for logistics companies will be a powerful boost for companies to reduce capital costs, expand the scale of operations, and upgrade production equipment. It contributes to the improvement of the overall output of the logistics industry and also contributes to the steady growth of the entity's national economy. Therefore, for a project with a large amount of financing, the financing capacity and debt-paying ability of the enterprise are crucial. The investment of enterprises in logistics companies is mainly reflected in the investment in fixed assets such as production equipment and transportation tools. High capital investment reduces the liquidity of the company's capital, and may encounter shortages of short-term production and operation funds, increasing the probability of financial risks. Austrian political economist Joseph Schumpeter proposed the role of "innovation" in economic development. He believes that the scale of the company is conducive to innovation. Continental logistics companies are large in scale, but scale advantages have not helped the industry's innovation capability. An important reason for this status quo is that the current mainland logistics industry market is still not standardized and has not formed a well-developed competitive market order. Therefore,

the profitability of the logistics industry is not high, and even large logistics companies can hardly obtain enough capital to invest in innovative activities. Therefore, logistics companies should rationally improve the internal industrial organization structure. The government should strive to build a fair market competition environment and enhance the logistics company's innovation capabilities.

#### **1. 4 The content and framework of research**

In this paper, the major research content is to introduce non-financial information into the study of financial crisis early-warning model for listed companies of logistics companies, that's to say, to verify whether the addition of non-financial information can enhance the accuracy of financial crisis early warning in the logistics industry. The main research content can be divided into the following points:

The first chapter is introduction. It mainly introduces the research background, research purpose and research significance of the construction of logistics companies and the optimization of financial crisis warning model. And through the review of the theory and status quo of logistics companies, the development status of Chinese physics enterprises is introduced in detail. At the same time, according to the characteristics of the logistics industry, combining the market perspective, the causes of the financial risks of logistics companies are analyzed. Finally, the overall planning of this article's research content and the framework of writing put forward the possible innovation of this research.

The second chapter is a review for the research of the early warning of financial crisis. It mainly reviews the previous theoretical researches on the early warning of financial crisis, and sorts out the key domestic and foreign research results, which provides the theoretical basis for the following research of the paper.

The third chapter explains the explanation of the research method. First, put forward the research hypothesis of this study. Provide basic preparations for the actual demonstration of the subsequent Chapter IV. Second, determine the research sample, and conduct an accurate demonstration of the source of the sample data and the selection criteria of the sample. According to the selection principle of early warning indicators, the financial indicators and non-financial indicators that can reflect the characteristics of logistics enterprises are initially selected, and the financial early warning indicator system for logistics enterprises is initially established. Finally, a brief introduction of the significance test, factor analysis, logistics regression analysis and other research methods used in this study is explained, and the financial indicators and non-financial indicators of the primary election are analyzed to select indicators that can fully reflect the characteristics of logistics companies. For the fourth chapter, logistic regression analysis is used to construct logistics company financial crisis warning model.

The result of the fourth chapter is the key to the entire study. In this section, this article will use logistics regression analysis method to analyze the financial and non-financial indicators that have been selected by significance test and factor analysis. Use this to build the basic model of logistics model based on pure financial indicators. And introduce non-financial indicators to improve the formula. Finally, use the regression model to test the formula. Test the above basic formula to predict the accuracy of financial crisis.

The sixth chapter is the summary and prospect. First, summarize and sort out the conclusions drawn from empirical research. Second, reflect on the inadequacies of this study and provide reference for future follow-up studies of scholars. Finally, put forward relevant suggestions based on the research conclusions and the development of logistics enterprises.

### **1.5 The possibly innovation point in this paper**

(1)The previous related researches are mostly based on quantifiable financial indicators. In recent years, there are some scholars who have tried to introduce non-financial information into the logistic regression model. However, most studies only introduced one or two non-financial indicators and it didn't show the effect of non-financial information systems on the early warning of financial risks, and the studies of introducing non-financial information are mainly for manufacturing companies, or singly studied the non-financial information of logistics company, which didn't embody the overall general influence of the non-financial indicators to the logistics industry.

Based on the study of financial indicators, and in terms of the features of listed companies of China's logistics companies, the paper has introduced non-financial information on various aspects, such as internal control and corporate governance and other aspects, and also screened out the significant indicators that can distinguish companies from financial crisis. In the end, it has got a beneficial early warning effect by the empirical analysis.

(2)For the selection of samples, the paper takes the listed companies of logistics companies from 2006 to 2017 as the research object, which covers a wide span in time, covers multi-situations of macroeconomic market fluctuations in the logistics industry, and through the comparison between short-term sample studies and single sample study, it can be more macroscopic to exclude some short-term and abnormal affects of market factors.

(3)The time of data collected in this paper is the first two years and three years before the financial crisis and the indicator data of the first two years and the first three years were all significant screened out. There is no data which simply chooses one year to deal with one-time significance test in order to establish a more scientific and effective early warning model.