



# Research on early warning method of major financial risk based on abnormal detection

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**Abstract.** With the continuous advancement of the digitization of the supply chain in the financial field, the integration of manufacturing and retail has become one of the development trends of financial digitization, and data resources have gradually become a bridge between production and sales. The Customer-to-Manufactory (C2M) e-commerce model with user-driven industrial customized production has become one of the important ways for the manufacturing industry to achieve digital transformation. However, the C2M e-commerce model has obstacles and bottlenecks in practice, mainly in two aspects: First, digital capabilities need to be improved. Second, the development of big data resources related to consumers is insufficient. Therefore, this study explores the early warning ideas of major risk methods through the analysis of abnormal detection values.

**Keywords:** outlier detection; finance; risk; early warning

## 1 Introduction

The financial digital economy has become a new driving force and new opportunity for the high-quality development of my country's economy. The digital economy is an economic form with data as the key production factor, modern information network as an important carrier, and digital technology application as the main feature. China attaches great importance to the important role of the digital economy in economic and social development, and regards the development of the digital economy as one of the country's important development strategies [1]. In 2015, the Fifth Plenary Session of the 18th Central Committee put forward the "National Big Data Strategy" for the first time, which will comprehensively promote the development and application of big data in my country and promote economic transformation and upgrading as one of the important national strategies [2]. In 2017, China's "Government Work Report" was written into the "digital economy" for the first time, proposing to promote the in-depth development of "Internet +" and accelerate the growth of the digital economy. With the country attaching great importance to it, the proportion of digital economy in my country's total economy continues to rise [3-4]. In 2019, the digital value-added of China's supply chain reached about 28.8 trillion yuan, accounting for 29.9% of GDP, becoming an

important supporting force for my country's economy. With the outbreak of the new coronavirus pneumonia, my country's economy has experienced quarterly negative economic growth for the first time since the establishment of the GDP accounting system in 1992[5-6]. The Party Central Committee and the State Council attach great importance to the steady, healthy and sustainable development of the economy [7-8]. In 2020, the National Development and Reform Commission of China issued the "Opinions on Supporting the Healthy Development of New Business Formats and New Models, Activating the Consumer Market and Driving Employment Expansion", emphasizing that digital innovation will play a more effective role in improving the quality and efficiency of the real economy, and promote the "Internet + "And big data, platform economy, etc. are entering a new stage. Deeply promote the digital transformation of various industries and fields, and focus on improving the digital transformation. In the same year, the National Development and Reform Commission and the Office of the Central Network Security and Informatization Commission jointly issued the "Implementation Plan for Promoting the Action of "Using Data and Empowering Intelligence" to Cultivate New Economic Development, emphasizing vigorously cultivating new formats of the digital economy and further promoting the digitalization of enterprises transformation. Build a digital enterprise and promote the digital transformation of enterprise R&D, design, production and processing, operation management, sales services and other businesses. It can be seen that the digital revolution has accelerated its penetration into all fields of my country's supply chain, and the digital transformation of the supply chain has become the core of the digital economy. Supply chain digital transformation is the process of delivering digital content electronically from the source (supplier) to the destination (consumer), with the aim of establishing a system that integrates smart design, smart procurement, smart manufacturing, digital marketing and digital customer relationship management. digital supply chain system. The development of the digital economy has enhanced the resource attributes of data. The role of data in the development of enterprises has become increasingly prominent and has become a core factor of production. In 2017, the sales revenue of Huawei's business reached 54.9 billion yuan, a year-on-year increase of 35.1%, of which digital business accounted for nearly 10%. European Kearney pointed out in a survey report that 72% of companies surveyed believe that big data can produce powerful improvements in business management. Companies that use more than 80% of their products in inventory generate 20% more benefit than companies that use more than 80% of their products to order, underscoring the high importance of big data analytics for stocking companies. The Senior Solutions Leader of HCL's Retail and CPG Consulting Business Unit claims that the information provided by big data can improve business management efficiency, relationships with other entities, agility and initiative. Big data has had a huge impact on the digitization of supply chains, and big data-driven model changes have become one of the important driving forces for the digital transformation of supply chains [9].

## 2 Research on outlier detection and early warning method

In the financial field, the research on supply chain digitization started late, mainly involving research in the field of digital supply chain management. With the spread of the new crown pneumonia epidemic in the world, the traditional supply chain system has been severely impacted, while the global industrial chain digitization, value chain digitization, innovation chain supply chain intelligence are increasingly trending, and profoundly affect the world economy. The dynamics, structure and shape of growth. The fields of modern production and manufacturing, producer services and life services have presented a new model of online, intelligent, interactive and integrated development of online and offline. At the same time, with the digital platform as the carrier, through the effective use of digital technology to achieve the precise exchange of goods, digital products and services, digital knowledge and information, and then promote the transformation of the consumer Internet to the industrial Internet and finally realize the intelligent digital trade of manufacturing industry has also become a It is an important way of cross-border e-commerce services. Under the circumstance of increasing uncertainty in the business environment, the digital capabilities of enterprises are an important means for the formation of supply chain elasticity. Enterprises can build a digital platform, integrate participants in the supply chain network, improve the efficiency of the supply chain network and jointly fight against supply chain risks through digital collaboration with better stakeholders. It can be seen that the digital transformation of the supply chain plays an important role in coping with supply chain risks. In addition, digital empowerment based on big data technology is a key way to improve the operational efficiency of enterprises in this new era. The application of big data technology can not only improve the operation efficiency of upstream procurement, midstream processing and downstream sales, etc. of the supply chain, but also help enterprises make correct decisions and maximize the profits of the enterprise supply chain. Effective informatization tools can quickly obtain relevant information about supply chain operations and comprehensively understand all elements of the supply chain, which is crucial to the monitoring and management of supply chain operation status.

In terms of outlier detection, with the rapid development and widespread influence of Information and Communication Technology (ICT), Big Data (BD) has become part of an organization's assets. The book "The Era of Big Data", which is known as the pioneer of big data, pointed out that big data is "without a shortcut such as random analysis (sampling survey), but using all data for analysis and processing". The definition given by the McKinsey Global Institute is: "A data collection whose scale greatly exceeds the capabilities of traditional database software tools in terms of acquisition, storage, management, and analysis. The four characteristics of low data type and value density". The US National Institute of Standards and Technology (NIST) believes that "big data refers to the amount of data, acquisition speed or data representation that limits the ability to perform effective analysis using traditional relational methods, or requires the use of horizontal scaling mechanisms to improve processing efficiency". The Chinese government defines big data as, "Big data is a collection of data characterized by large capacity, many types, fast access speed, and high application value. Collect, store, and correlate to analyze

It can be seen that the definition of big data has triggered extensive discussions in the industry and academia, and the 5V characteristics of big data have been generally agreed. The 5V characteristics of data refer to: Volume, Variety, Velocity, Veracity and Value. Large volume refers to a large amount of data. Generally speaking, data The exponential growth in volume poses a challenge to the performance of existing acquisition, storage, and computing devices. Multivariate means that data sources can be heterogeneous (e.g., sensors, Internet of Things (IoT), mobile devices, online social networks, etc. ), the kinds of data obtained can include structured, semi-structured and unstructured formats. High speed refers to the speed at which data is generated, transmitted and processed, and the data can be batch, real-time, near real-time or streaming. Authenticity The importance of data quality and trust level is emphasized. Since the sources of big data are diverse and heterogeneous, they will contain a certain degree of uncertainty and unreliability. Finally, value refers to the low value of big data. Big data has underutilized data value that can support decision-making, and the potential value of such data can be tapped using machine learning and other methods.

(1) Data acquisition: This is the process of acquiring raw data. The data acquisition process consists of two stages: data acquisition approach and data transmission. Data acquisition approaches include wearable sensors, web crawlers, and network traffic and communication monitoring. These methods allow collectors to collect data on a large scale, automatically and continuously. Data transmission is through reliable network architecture, such as IP backbone network and content distribution network, data will be transmitted to the data center, and adjusted according to the internal storage location of the data center.

(2) Data processing: This stage aims to improve the quality of data and remove the influence of factors such as interference, redundancy and consistency in the original data. Common steps include data integration, data cleansing, and redundancy elimination. Data integration is the centralization of data obtained from different data sources.

First of all, big data is an important information asset in financial risk analysis. Reasonable and effective use of the value brought by big data is of great significance for enterprises in the supply chain to improve the predictability and scientificity of decision-making and realize digital transformation.

Secondly, the big data value chain is an important process for mining the value of big data. Through the six processes of data generation, acquisition, processing, storage, analysis and application, the value of data can be gradually extracted from the original data to the whole life cycle of the real situation. .

Therefore, we can make full use of big data technology to establish a major financial risk early warning mechanism based on outlier detection to realize risk analysis.

### **3 Conclusion**

Based on the development of supply chain digitization in the financial field, fully analyze the relationship between financial resources and sales, through the analysis of the

e-commerce model in the financial field, clarify the current problems, and propose improved countermeasures. analysis, and explore the early warning ideas of major risk methods.

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