Research on Blockchain-Based Strategic Management Innovation of Emergency Resource Supply Chain

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Abstract: This paper analyzes the main problems and difficulties in the economic development of Fujian Province in China, and probes into the effective countermeasures to accelerate the economic improvement of Fujian Province through many field investigations inside and outside the province. This paper focuses on Research on Blockchain-Based Strategic Management Innovation of Emergency Resource Supply Chain in Fujian province. After thorough investigation and analysis, the research group puts forward several feasible schemes.

1 INTRODUCTION

The strategic management of emergency resource supply chain represented by masks and other medical supplies reflected in the epidemic prevention and control work of "COVID-19" at the beginning of 2020 will certainly become an emerging research hotspot for scholars at home and abroad. From Hubei Province to Jiangsu, Sichuan, Guangdong, Fujian and many other places, there have been shortages of medical supplies to varying degrees, and there have been extreme cases of local governments withholding foreign supplies. The poor operation of the emergency supply chain has left a deep impression on people. In the blockchain system, other business subjects can conduct dynamic real-time supervision and interaction on the transaction behaviour and distribution activities of suppliers, which can improve the efficiency of emergency resource management and logistics distribution.

According to the "2020 Statistical Communique on National Economic and Social Development of Fujian Province" issued by the Fujian Provincial Bureau of Statistics, the annual GDP of Fujian Province in 2020 reached 4.390389 billion yuan, an increase of 3.3% over the previous year. Of which, the added value of the primary industry was 273.32 billion yuan, up by 3.1%; the added value of the secondary industry is 2,032.88 billion yuan, up 2.5%; The added value of the tertiary industry was 2,084.278 billion yuan, up by 4.1%. The added value of the three industries accounted for 6.2 percent of the GDP of the primary industry, 46.3 percent of the secondary industry and 47.5 percent of the tertiary industry. The online retail sales of wholesale and retail enterprises above designated size reached 140.592 billion yuan, up 14.2 percent over the previous year. The revenue of key Internet enterprises reached 68.09 billion yuan, an increase of 8.8% over the previous year. The profits of industrial enterprises above designated size reached 347.08 billion yuan, down 9.7% from the previous year. In terms of economic types, state-owned enterprises posted a loss of 110 million yuan from 194 million yuan in the same period last year. The profit of collective enterprises reached 604 million yuan, up 8.8 percent; Joint-stock enterprises 232.00 billion yuan, down 6.3%; Enterprises invested by foreign investors and those from Hong Kong, Macao and Taiwan reached 111.115 billion yuan, down 16.1%; Private enterprises reached 178.604 billion yuan, down 7.6%. The asset-liability ratio of industrial enterprises above designated size was 50.4 percent, down 0.4 percentage points from the previous year. The cost per 100 yuan of main business income was 86.51 yuan, and the profit margin of operating income was 6.26%.

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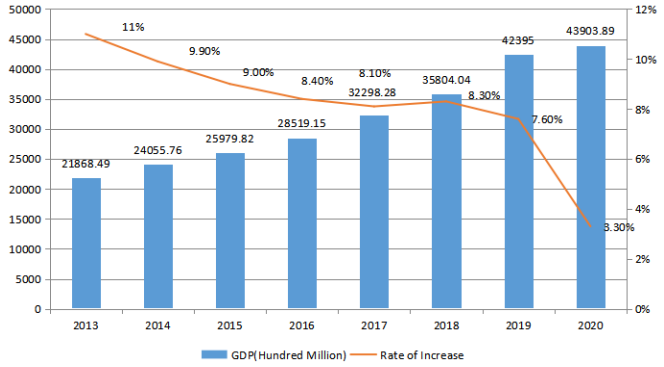
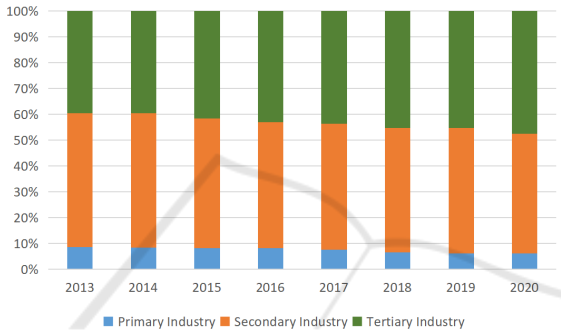


(The data are from the China Business Industry Research Institute database)

Figure 1: Total GDP of Fujian province and its growth rate from 2013 to 2020.



(The data are from the China Business Industry Research Institute database)

Figure 2: The proportion of added value of the three industries in GDP of FuJian province from 2013 to 2020.

During the "13th Five-Year Plan" period, the province's GDP rose to 3 trillion yuan and 4 trillion yuan successively, with an average annual growth rate of 7.1%. Total revenue in the general public budgets reached 2.425.114 trillion yuan, local government revenue in the general public budgets reached 1.46316 trillion yuan, and expenditure in the general public budgets reached 2.408.478 trillion yuan, 1.4 times, 1.4 times and 1.6 times the figures for the 12th Five-Year Plan period, respectively.

In 2020, the economic volume of Fujian Province will be 4 trillion yuan (4.390389 billion yuan), accounting for about 4.32% of the national economic aggregate of 10,15986 billion yuan in the same period, and 8.35% of the eastern ten provinces and cities' economic aggregate of 5,25733 billion yuan in the same period.

Influenced by COVID-19, the overall economic growth rate of Fujian has slowed down, but the economy of Fujian is recovering, and the GDP growth rate of Fujian continues to lag behind that of the whole country. First of all, for the service industry, whose GDP contribution rate has increased significantly in recent years (after 2015), consumption in some areas of Fujian showed negative growth in the prevention and control measures in the first and second quarters of 2020. The resumption of work and production comes first from industry, because only when industry is in operation can human beings have income and go to various businesses for consumption. Otherwise, the service industry will face the problem of lack of customers. The service sector accounted for nearly 50% of employment, up from 30% in 2003. The resumption of work and production began to focus on exports because the domestic market was damaged by a two-month closure. This approach is advantageous to Fujian. Fujian is already a major exporter of daily necessities. The first thing to revive is the production of daily necessities to ensure daily necessities. The research team believes that the current supply chain management system has fallen behind and cannot adapt to the supply chain management after the epidemic. The supply chain management mode based on blockchain technology has a high application prospect, so it is necessary for the government to raise the infrastructure of blockchain technology and other aspects in advance, and pre-research a new supply chain management mode.

The research is supported by the achievements of some projects, such as the “Research on the block chain technology management innovation of emergency resource supply chain” (FJ2020B045) and which is a Fujian Social Science Planning Project, the “A special study on the system of River and lake chiefs in Yongchun County” (2020H25) which is Quanzhou Social Science Planning Project.

This paper, which laying the burden upon the current situation of Economic development in Fujian, the research team concluded that government scientific research was ineffective in managing emergency resources during the early stages of COVID-19. The emergency supply chain management system should be further improved, and the research group's research on the management innovation of blockchain technology in the emergency resource supply chain is given. The overall organization of the paper is as follows. Section I we present the current situation of Economic development in Fujian, and it lists a lot of data and charts. After the introduction. In Section II, Overview of Emergency Supply Chain Management are Clarified in Section III, which showed Blockchain Construction of Emergency Supply Chain Management, among them, a number of measures to promote the construction of blockchain related infrastructure are proposed and elaborated in detail. In Section IV, Solutions on Emergency Supply Chain Management by Blockchain Technology is listed. Finally, Section V concludes the paper.

2 REVIEW OF RESEARCH IN THE FIELD OF EMERGENCY SUPPLY CHAIN MANAGEMENT

Emergency management is one of the important research directions in management science. In the COVID-19 epidemic prevention and control work at the beginning of 2020, some emergency resources cannot be in place in time. For example, various materials such as masks and other medical supplies are in short supply, which has reflected many problems in China's existing emergency resource supply chain management, such as insufficient efficiency in allocating emergency resources and urgent need to improve the orderly management. Supply chain management of emergency resources will become an emerging research hotspot for scholars at home and abroad, and modern supply chain management relies on new information sharing and transmission technology, so supply chain management of emergency resources that applies blockchain technology will become an important research direction.

Due to the sudden emergency event, the event whether it is the time, place, or event such as the nature, scale with a fair degree of certainty, accidental and randomness, emergency rescue equipment manufacturing resources agglomeration and the service demand accurate prediction is very difficult, there are strong weak predictive or even blindness, but at the same time, An emergency event trigger, emergency response mechanism to activate, emergency rescue, the directivity and demand for emergency rescue equipment is very clear, need to be accurate and timely and efficient resource agglomeration and service, the faster the agglomeration manufacturing resources, the sooner you finish manufacturing task, the more help to prop up the rescue work, to prevent the spread of the incident and deterioration, minimize loss of life and property. Therefore, the current research on post-disaster emergency resource management by domestic and foreign scholars mainly focuses on resource scheduling, logistics distribution, production supply chain, performance system, game between supply and demand and decision-making, etc.

Emergency resource scheduling: Zhang Yibin et al. studied the optimal emergency strategy of the system and introduced the system dynamics model to simulate the operation of the system, so as to optimize the "order to level" inventory under the risk of supply interruption. Sheu uses the hybrid fuzzy clustering method to solve the problem of dynamic allocation of emergency resources under emergency needs.

Emergency logistics distribution: common logistics distribution research has considered minimizing logistics cost, minimizing unsatisfied quantity, minimizing service completion or delay time; And the maximum minimum satisfaction and the minimum maximum ambiguity percentage considering the robustness of the target; The study of allocation optimization considering multi-objective; Lin proposes a multi-objective optimization of minimum unsatisfied degree, scheduling cost and equilibrium.

Emergency production supply chain: Annaka Eiko analyzed the emergency production situation of the broken auto production supply chain in Japan after the Fukushima nuclear leakage event, and his research held that "a strong production supply chain in emergency situations" should be built. Zhang Zili studied the production of post-disaster emergency supplies and believed that the production capacity

reserve not only plays an important role in the supplement of physical reserves in terms of space and time, but also can guarantee the subsequent supply of emergency supplies.

Emergency performance system: Machao et al. discussed the feasibility of risk diversification contract under uncertain demand and pointed out that risk diversification contract can coordinate the supply chain. Under the framework of collaborative governance theory, Fanbo first analyzes the inter-departmental intelligence linkage system based on the supply chain theory to provide construction strategies for the optimization of emergency linkage response. Lixu et al. used the method of dynamic research based on system dynamics and discussed the influencing factors and solutions for improving the performance of supply chain inventory management from the perspective of dynamic complexity.

Supply and demand game and decision: Yuxiaohui et al. analyzed the forms of common three types of fuzzy alliance cooperative games and their corresponding distribution strategies, and analyzed the cooperative game forms and optimal distribution strategies of fuzzy alliance with the greatest benefits, providing a certain basis for income distribution for cooperation problems under uncertain circumstances. Zhaohuanhuan et al. made use of game theory and optimization model to build incentive model, which can encourage suppliers to invest more efforts through the main manufacturer to increase coordination level and share the development cost of suppliers, so as to improve the interests of the main manufacturer and suppliers and maximize the overall profit of the supply chain.

In the past few years, blockchain has attracted great attention from countries around the world, including China. Scientific research institutions in various countries have accumulated certain technologies and research achievements in blockchain research. Supply chain information sharing refers to a state in which each business subject or each business link in the supply chain can share the information of other business subject or business link. The development of information technology and network technology, supply chain management informationization and network transactions promote the information sharing of supply chain. Therefore, supply chain information sharing based on block chain technology will greatly improve the efficiency of supply chain management of emergency resources, and it will certainly become an important means to improve the efficiency of supply chain management. TOYODA K et al. built a block chain based on the product ownership management system to meet the security requirements of supply chain business, and evaluated the performance of the system. Tseng J H et al. proposed a drug supply chain management model based on Gcoin blockchain to create transparent drug transaction data and realize the transformation of drug supply chain from inspection and testing to networked supervision. All nodes joining the supply chain management model will be able to participate in preventing counterfeit drugs and protecting patients' rights and interests. Goertzel B et al. proposed that currency based on block chain technology could achieve transparent and open transactions, which has development potential under the environment of global economic integration, open collaboration and network interconnection, and is conducive to maximizing the economic benefits of individuals and the society. It can be seen that the application of block chain technology in emergency resource supply chain management system is an innovative direction of emergency resource management worthy of attention.

Group argues that, given the nature of the block chain itself, block chain was applied to emergency resources supply chain management, emergency resources supply chain information can be spread by P2P for emergency resources supply chain business main body in the form of sharing, for all emergency resources supply chain business activities can add block chain system coordinate business subject regulation and common decision-making, integration of the supply chain resources. It improves the accuracy of emergency resource supply chain decision and solves the problem of bullwhip effect between purchase and inventory in traditional supply chain management. Blockchain has an undeniable traceability of information and a decentralized consensus certification system, which promotes the formation of supply chain trust ecology and provides an information platform and a credible group preference system for the supply chain to select the supplier (or the demand side). In the blockchain system, other business subjects can dynamically supervise and interact with suppliers' supply and distribution activities in real time, which improves the efficiency of supply management of emergency resources and logistics distribution. Therefore, the application of blockchain technology will effectively improve the operational efficiency of the emergency resource supply chain management system.

3 BLOCKCHAIN CONSTRUCTION OF EMERGENCY SUPPLY CHAIN MANAGEMENT

In the face of large-scale disasters, people are often unable to return to their posts normally, which leads to different degrees of shutdown of enterprises in various places. Reasonable emergency resource supply chain management will become the logistics support for all kinds of materials, and prevent the domino effect of shortage of medical and livelihood materials. In the COVID-19 epidemic prevention and control at the beginning of 2020, many places from Hubei to Jiangsu, Sichuan, Guangdong, Fujian and other provinces have experienced shortages of medical supplies to varying degrees, and there have been typical cases of local governments withholding foreign supplies. In the blockchain system, other business subjects can conduct dynamic real-time supervision and interaction on the transaction behaviour and distribution activities of suppliers, which will greatly improve the efficiency of emergency resource management and logistics distribution. The supporting policies for the strategic management of emergency resource supply chain under the blockchain technology will certainly become the focus of relevant policy research.

Blockchain construction needs strong support from the local Fujian government. Therefore, the research group puts forward the following suggestions to the government:

First, data structure isomorphization design and transformation. Considering the strategic height of block chain technology, the provincial overall planning leading group and the expert committee shall be established as soon as possible, and invited experts from home and abroad to participate in the planning, positive preparation of the various types of heterogeneous systems based on the relationship to the national economy and people's livelihood TongGouHua database data structure design and modification, and timely complete block chain data synchronization.

Second, set priorities and try first in some areas. In order to achieve the goal of the integration of blockchain and economic and social development, priorities should be set, and some fields should be tried first. Blockchainization of some livelihood systems can be tried first, such as industrial and commercial data of enterprises, financial and taxation data of residents, medical insurance and social security data of residents, household registration data, medical data of hospitals, industrial and commercial data, judicial and legal data, traffic management/administrative service data, and then extended to financial and energy data.

Third, moderate technical expansion on the original infrastructure. Different industries have different information architecture foundations, and blockchain algorithms under heterogeneous systems must have many practical difficulties and security loopholes. The library and literature database, teaching database and basic research database between universities and scientific research institutions can be experimentally connected and moderately expanded on this basis. In terms of industrial application, the three major operators in China take the lead in the construction of information infrastructure, so it is suggested that the communication industry should be the first to try.

Fourth, improve security level, avoid data disaster. In the block chain technology environment to do a good job of network information security technology prevention. Blockchain technology has no central structure. Rational application can effectively improve the data security of the database storage nodes of the government, the military and various industries, and prevent the data loss caused by the catastrophic collapse of a single node. But once the system is cracked, and hidden as one of the data nodes, it is very likely to occur irreparable comprehensive data disaster. Therefore, the application of blockchain technology at the same time, but also put forward more severe challenges to the network security technology. In the short term, it is recommended to conduct periodic offline data backup in case of accidents.

Fifth, issue digital RMB and eliminate intermediate settlement. From the perspective of national economic development, it is suggested that the application of block chain technology should be actively planned and the international digital RMB should be issued as soon as possible. Thus, a foreign exchange settlement mechanism without intermediaries can be established in the international monetary business. This will help to overthrow the hegemony of the US dollar and subvert the empire of the US dollar, so as to gain certain advantages in the subsequent financial wars between China and the US.

Sixth, the standardization of shared data structure has a long way to go and should be started as soon as possible. Should stand in the height of the world pattern, should as soon as possible for China's upcoming blockchain technology upgrade of the industry data structure standardization and unified planning. The work in this area is urgent and the

workload is huge. It requires both keeping in mind China's national conditions and planning from a global perspective to consider future overseas services in advance.

Seventh, increase investment in directional basic scientific research and reserve post-block chain technology. On the application of blockchain technology, universities and research institutions cannot be absent. And in the application of the existing blockchain technology, the corresponding blockchain security technology, as well as post-blockchain technology research should be timely followed up. Therefore, in the blockchain related technology, universities and scientific research institutions should be timely increased investment in research and development.

Eighth, make compensation policy, tear down data wall. Blockchain technology will break the data barriers of several original information monopolies and affect the interests of some enterprises and individuals, such as the existing literature database companies. Therefore, the government should give full consideration to the issue of benefit redistribution in the application of blockchain technology, and formulate corresponding compensation policies. Data monopoly enterprises have played a great role in promoting the development of China's database in the past, but the conflict with the blockchain strategy may hinder the country's economic and social development in the future. Therefore, the count-down data wall should be pushed to develop a higher level of data sharing form.

4 SOLUTIONS ON EMERGENCY SUPPLY CHAIN MANAGEMENT BY BLOCKCHAIN TECHNOLOGY

First, it is suggested to build an emergency resource management platform. It is suggested to increase capital investment and make use of the existing cloud computing platform to carry out real-time monitoring of all kinds of emergency material reserves and production conditions in the jurisdiction. This is because the operation of the blockchain-based resource management system cannot be realized under the stand-alone system, and the operation requirements of the emergency resource management system can only be met through cloud computing, cloud storage and other services based on the cloud platform.

Second, push block chain technology applications and improve the government emergency management efficiency will block chain technology applied in emergency resource management, the emergency resources supply chain information spread by P2P sharing emergency resource management for the government in the form of subject, add block chain system coordinate business subject regulation and common decision-making, enhance the accuracy of decision-making of supply chain, Solve the bullwhip effect of purchasing and inventory in traditional emergency resource management.

Third, formulate policies to encourage trading information technology application block chain, trading information using open transparent characteristics of block chain technology, all kinds of emergency resources production enterprises and supplies reserve unit priority implementation block chain technology application, use of emergency resources management platform, the transaction information, logistics information, production information encryption of all Shared.

Fourth, the government promote the emergency resources logistics new technology application, combined with block chain radio frequency tracking technology and modern logistics technology, applied to all kinds of emergency resources production enterprises and stockpiles, track all emergency supplies, determine the government, enterprises, material use, the three parties for emergency supplies logistics is completely transparent, can effectively prevent emergency supplies trapped.

5 CONCLUSION

In this paper, A research on Blockchain Technology Management Innovation of Emergency Resource Supply Chain was presented. Under the epidemic situation, emergency supply chain adjustment in Fujian is becoming a problem that must be paid attention to in the subsequent economic development. After in-depth investigation and analysis of the problem, the research team proposed several measures to promote the construction of blockchain-related infrastructure as soon as possible and to build a blockchain-based emergency resource supply chain management system, including: the construction of emergency resource management platform; Promote the application of blockchain technology to enhance the effectiveness of government emergency management; Formulate policies to encourage the use of blockchain technology for trading information; The government promotes the application of new

technologies in emergency resource logistics and other corresponding solutions.

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