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2023 5th International Conference on
Innovation Management and Information Technology

2023 7th International Conference on
Economics, Finance and Management Science

May 25, 2023
Virtual Conference

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Introduction

2023 5th International Conference on Innovation Management and Information Technology (ICIMIT2023) and 2023 7th International Conference on Economics, Finance and Management Science (ICEFMS2023) are organized by Shanghai Laixi Conference Services Co., Ltd. According to the similarity among the topics of ICIMIT2023 and ICEFMS2023, ICIMIT2023 is held in conjunction with ICEFMS2023 virtually on May 25, 2023.

ICIMIT2023 and ICEFMS2023 serve as an optimal platform for specialists, scholars and researchers in the field related to innovation management, information technology, economics and finance to facilitate academic communications and exchange ideas. The conferences offer an academic space known for its interdisciplinary approach as well as a space for academics and practitioners.

Major themes of the Conferences include:

Innovation Management: Business Innovation, Virtual Innovations, Digital Innovation Management, Business Models, Innovation Trainning & Teaching, Circular Innocation, Innovation Leadership, Measurement of Innovation, Responsible Innovation, Transferring Knowledge for Innovation, etc.

Information Systems: Foundations of Information Science, Mathematical Linguistics, Automata Theory, Cognitive Science, Theories of Qualitative Behaviour, Artificial Intelligence, Computational Intelligence, Soft Computing, Semiotics, Computational Biology and Bio-informatics, Implementations and Information Technology, etc.

Economics: Microeconomics, Marxian Economics, Neoclassical Economics, Classical Political Economy, Keynesian Economics, Production, Cost, Efficiency, Supply and Demand, Welfare, Unemployment, Inflation and Monetary Policy, Fiscal Policy, etc.

Finance: Capital Markets, Financial Institutions, Corporate Finance, Corporate Governance, The Economics of Organizations, Personal Finance, Accounting, Public Finance, Investment Management, Risk Management, Financial Mathematics, etc.

The abstracts that were selected had a complete peer review process. Selected papers are also published at the cooperating journals of each conference. They show the richness in interdisciplinary approaches, theories, models and applied research presented in the conference.

We would like to thank you for your scientific contribution to ICIMIT2023 and ICEFMS2023 and look forward to having the opportunity to showcase and disseminate your research.

Special thanks also to the organizing committee, and all the people that worked hard, to bring in light this considerable event.

Sincerely,

ICIMIT2023 and ICEFMS2023 Organizing Committees

CONTENTS

Financial Technology, Life Cycle and Enterprise Entity Investment

Na Li

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Abstract: The level of physical investment of enterprises determines the speed of high-quality development in China. At the same time, the rapid development of financial technology continuously empowers the entity investment of enterprises, and occupies an increasingly important position in the development of enterprise entity investment. However, there are significant differences in the impact of financial technology on the entity investment of enterprises at different stages of life. Based on the data of non-financial enterprises in China from 2011 to 2021, this paper studies the impact of financial technology on the entity investment of enterprises in different life cycles, and its inherent mechanism and heterogeneity. After constructing financial science and technology indicators through text mining, empirical research found that financial science and technology significantly promotes the real investment level of enterprises, and significantly promotes the physical investment of enterprises in the growth and mature period, but significantly inhibits the physical investment of enterprises in the recession period, the conclusion is still correct after using the replacement of interpreted variables, data deletion and tool variable processing. Financial technology can improve the real investment level of enterprises by alleviating information asymmetry, improving the return on real investment, and improving the efficiency of real investment. Heterogeneity analysis found that the promotion of financial technology to enterprise entity investment is more significant in state-owned enterprises, central and western enterprises, and small-scale enterprises. Further research on the mechanism shows that financial technology can improve the real investment level of enterprises by alleviating the financing constraints of enterprises and reducing management costs. Therefore, it is necessary to continuously increase support for financial technology, actively play the role of big data, blockchain and other technologies in supporting financial technology, and continuously improve the enabling role of financial technology in physical investment.

Keywords: Financial Technology, Life Cycle, Enterprise Entity Investment

Research on Automobile Supply Chain Under the Background of Double Credit Policy

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Abstract: Green and low carbon has become one of the key points in China. Under the background of low carbon travel, with the improvement of green travel awareness and the implementation of carbon emission reduction policies, the new energy vehicle market is developing rapidly. The implementation of new energy vehicles can largely solve the problem of serious pollution caused by large carbon emissions of traditional vehicles. Now, more and more consumers are also turning their eyes to new energy vehicles powered by low carbon and green energy. At present, China has also entered the forefront of the world's new energy vehicle market. However, China's new energy vehicle sector is not strong, and it still needs some time for development and progress. The implementation of China's new energy vehicle subsidy policy has followed closely. In recent years, the subsidy policy has gradually declined, and the relevant departments have formulated a double-point policy. The implementation of the dual-point policy has had a huge impact on different automobile manufacturers. As one of the most complex supply chains, the impact of the automobile supply chain on the automobile manufacturers also permeates the entire automobile supply chain. In the face of the double-point policy, how the automobile manufacturers and distributors make decisions to maximize the benefits of the individual or the entire supply chain is worth exploring and studying. This paper studies the optimal decision under different contracts by establishing a model. Through decision analysis, the impact of fuel perception on individual fuel vehicles, manufacturers and distributors is obtained, and the impact on the entire supply chain is obtained.

Keywords: Double Credit Policy, Supply Chain Decision-Making, New Energy Vehicles

Study on the Trade Structure Effect of China's OFDI Under the Background of "the Belt and Road"

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Abstract: In today's world, the trend toward globalization and multi-polarization is gaining momentum. The countries along the "the Belt and Road" are gradually becoming important areas for China's foreign direct investment, and the bilateral trade volume is also expanding. Studying the trade structure effect of OFDI is conducive to optimizing the trade structure and promoting the economic cooperation among countries along "the Belt and Road". In this context, this thesis studies the trade structure effect of China's OFDI under the background of "the Belt and Road". Based on the panel data of China's direct investment and bilateral trade in countries along "the Belt and Road" from 2013 to 2021, this paper establishes a gravity model for regression analysis. The empirical results show that the relation between direct investment and the export of labor-intensive products is substitution, while the relation between the export of technology-intensive products is complementary. Direct investment promotes the import of labor-intensive products from the home country, restrains the import of technology-intensive products from the home country, and favors the import of resource-intensive products. The government should improve the relevant legal system, improve the open information platform, and strengthen macro-guidance. Companies should follow policy recommendations to improve investment efficiency and increase investment in innovation.

Keywords: The Belt and Road, OFDI, Gravity Model, Trade Structure Effect

Research on the Impact of Financial Openness on Industrial Innovation Capability -- A Spatial Panel Data Model Analysis Based on the Yangtze River Delta Region

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Abstract: In the process of financial expansion and opening up, further enhancing industrial innovation capacity is an important way to promote the integrated economic development of the Yangtze River Delta region. Based on the panel data of China's Yangtze River Delta city cluster from 2008 to 2021, the entropy value method is applied to construct the financial openness index. A spatial econometric model is constructed to analyze the impact and mechanism of financial openness on the industrial innovation capacity of the Yangtze River Delta from the perspective of spatial spillover. It is found that financial openness improves the industrial innovation capacity of the Yangtze River Delta region in general, and there is a significant spatial spillover effect. In addition, the effect of financial opening on industrial innovation capacity is heterogeneous at the regional level. As shown by the fact that the spatial spillover effect is not significant in the non-Shanghai metropolitan area compared to the Shanghai metropolitan area. Based on this, the author proposes that the Yangtze River Delta region should increase the financial opening up, actively play the radiation-driven role of the Shanghai metropolitan area, and promote the improvement of regional industrial innovation capacity. The study expands the understanding of the role of financial openness on the enhancement of industrial innovation capacity in the Yangtze River Delta region, and provides reliable empirical evidence to better promote the enhancement of regional industrial innovation capacity.

Keywords: Financial Openness, Industrial Innovation Capacity, Spatial Econometric Model

Research on the Impact of the Development of Digital Inclusive Finance on the Income Gap Between Urban and Rural Residents in Shandong Province

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Abstract: Based on the definition of relevant concepts, according to the current development of digital inclusive finance and the actual income of urban and rural residents in Shandong Province, combined with the digital inclusive finance index of Peking University and panel data of 16 cities in Shandong Province from 2013 to 2021, this paper uses fixed effect panel regression model and threshold regression model to explore the impact of digital inclusive finance on the income gap between urban and rural residents in Shandong Province, and regional heterogeneity analysis was conducted from the perspective of the three major economic circles in Shandong Province (provincial capital economic circle, jiaodong economic circle, and lunan economic circle). Research has shown that the development of digital inclusive finance can significantly reduce the income gap between urban and rural residents in Shandong Province, and its convergence effect has regional heterogeneity for regions with different levels of urban-rural income gap, with better convergence effect for regions with smaller income gap. The impact of digital inclusive finance on the urban-rural income gap in Shandong Province has a single threshold effect. When the level of urbanization exceeds the threshold, digital inclusive finance can better narrow the urban-rural income gap. Therefore, Shandong Province should focus more on the supply of digital inclusive financial services and products, continuously improve the financial service environment in rural areas, and fully leverage the role of digital inclusive finance in narrowing the urban-rural income gap.

Keywords: Digital Inclusive Finance, Income Gap Between Urban and Rural Residents, Fixed Effect Panel Regression Model, Threshold Regression Model

Study on the Impact of Green Finance on the Performance of Commercial Banks

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Abstract: On January 4, 2021, the Ministry of Finance of China issued Performance Evaluation Measures for Commercial Banks. One of the specific indicators of the performance evaluation index system of commercial banks is to serve the strategy of ecological civilization. In this context, the impact of green finance on the overall performance of commercial banks is greatly deepened. This paper selects the panel data of green finance business carried out by China's listed commercial banks from 2011 to 2021, takes green credit, green finance bond and other businesses as independent variables, takes performance as dependent variable based on the Performance Evaluation Index System of Commercial Banks, and uses a dynamic panel data model to study the impact of green finance business on the performance of commercial banks. The heterogeneity of different types of commercial banks is also discussed. The empirical results show that the development of green finance has a significant positive impact on the performance of commercial banks. Through the heterogeneity analysis, it is found that green finance has a significant promoting effect on the performance of state-owned banks and joint-stock banks, while the influence on urban commercial banks is not obvious. It is suggested that state-owned banks and joint-stock banks take the initiative to assume social responsibilities, actively expand green finance business, increase innovation in green financial products, improve the diversification of income, establish a sound fiscal and tax compensation mechanism, increase the amount of fiscal subsidies for urban commercial banks and other small and medium-sized banks, and improve their enthusiasm in carrying out green finance business.

Keywords: Bank Performance, Green Finance Business, Dynamic Panel Data Model

Research on the Influencing Factors of Carbon Neutral Bond Issue Pricing

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Abstract: Recently, under the support of Chinese policies, the carbon neutral bond as an important part of the green bond has developed rapidly. In order to more effectively play the role of carbon neutral bond, an innovative debt financing tool, in supporting carbon emission reduction projects, based on the background of the carbon peaking and carbon neutrality goals, this paper firstly sorted out and analyzed the possible influencing factors of carbon-neutral bond pricing. Then, based on the publication of the first carbon neutral bond in China in March 2021, this paper selects the carbon neutral bonds issued from March 2021 to March 2023 as sample data for descriptive statistics and empirical analysis, and selects representative appropriate bond data. Through the construction of multiple linear regression model, the final results show that: The price of carbon emission rights has no significant influence on the pricing of carbon neutral bonds. Corporate attributes have a significant influence on the issuing price of carbon neutral bonds. The asset-liability ratio of enterprises has a significant negative correlation with the credit spread of carbon neutral bonds. Finally, based on the conclusions of this paper, it can help the issuers of carbon neutral bonds better grasp the rationality of pricing, and provide theoretical basis for the reasonable pricing of carbon neutral bonds. In addition, relevant suggestions and measures are put forward for carbon neutral bond issuers, carbon trading market, government policies and issuing enterprises.

Keywords: Green Bonds, Carbon Neutral Bonds, Issue Pricing

The Impact of Green Credit on Corporate Green Investment Efficiency: A Test Based on Chinese Listed Enterprises in Heavy Pollution Industry

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Abstract: Green credit is a government policy to guide enterprises to balance environmental management and green economic development. Can green credit force heavy polluters to accelerate their green transformation? Based on this, this paper manually collects pollutant emission data of heavy polluters from 2016-2021 and examines the impact of green credit on green investment efficiency of heavy polluters using panel data of Chinese listed companies in heavy polluting industries. The results of the study show that: (1) the overall green investment efficiency of heavy polluting enterprises is low. (2) Green credit can significantly improve the green investment efficiency of heavy polluting enterprises. (3) The driving effect of green credit on green investment efficiency of heavy polluters is stronger in state-owned enterprises and enterprises with low executive shareholding. (4) The promotion effect of green credit on green investment efficiency of heavy polluting enterprises is strengthened by heavy polluting enterprises under non-green financial reform and innovation pilot zones and strong environmental regulation areas.

Keywords: Green Credit, Green Investment Efficiency, SBM, Tobit

Research on the Impact of Digital Inclusive Finance on Carbon Emissions

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Abstract: Global warming is one of the biggest challenges for all countries in the world at present, and the increase of carbon emissions is the main cause of rising temperatures. Reducing carbon emissions has become a global consensus, and China has also proposed carbon peaking and carbon neutrality goals. In recent years, digital inclusive finance has developed rapidly in China, which may have an impact on the ecological environment. Based on the panel data of 30 provinces in China from 2011 to 2020, this paper discusses the impact of digital inclusive finance on carbon emissions, and uses the mediating effect model to analyze the mechanism of action. The research finds that there is a significant negative relationship between digital inclusive finance and carbon emissions, and the impact of digital inclusive finance varies in different regions. In addition, the mechanism test shows that digital inclusive finance exerts an impact on carbon emissions mainly through technological progress and industrial structure. This paper has not only enriched the relevant literature on digital inclusion finance and carbon emissions, but also put forward targeted policy suggestions for giving full play to the carbon emission reduction effect of digital inclusion finance, which is of great significance for promoting the realization of carbon peaking and carbon neutrality goals.

Keywords: Digital Financial Inclusion, Carbon Emissions, Mediation Effect

The Impact of Diversification Strategy on the Mispricing of A-share Listed Companies -- A Case Study of the Consumer Industry

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Abstract: The phenomenon of stock mispricing refers to the deviation between the stock price and its actual value. In the Chinese A-share market, stock mispricing is quite common, with many stocks experiencing overvaluation or undervaluation. This phenomenon often leads to increased market instability and volatility, bringing great risks and losses to investors, while also having adverse effects on the effectiveness and healthy development of the market. The phenomenon of stock mispricing can lead to a decrease in resource allocation efficiency and unfair competition. If the prices of certain stocks are overvalued, their companies will receive more financing and investment, thereby gaining more competitive advantages in the market. In the long run, the phenomenon of stock mispricing can also affect investors' attitudes towards the market, leading to a blow to market activity and investor participation. Therefore, studying and solving the phenomenon of stock mispricing is of great practical significance for promoting the healthy and sustainable development of the A-share market ecosystem. The 18th National Congress of the Communist Party of China clearly stated that "technological innovation is a strategic support for improving social productivity and comprehensive national strength, and must be placed at the core of the overall development of the country." It emphasized the need to adhere to the path of independent innovation with Chinese characteristics and implement the innovation driven development strategy. Since the proposal of this strategy and with the increasingly severe global economic and international trade situation, the phenomenon of anti globalization and bulwarism has intensified, and many enterprises have generally adopted diversified business strategies. This study focuses on listed companies in the consumer industry and explores the impact of diversification strategies on stock mispricing. In this context, this paper selects China's A-share listed companies from 2012 to 2022 as the research sample, constructs enterprise diversification indicators, uses a multiple regression model, empirically studies the impact of enterprise diversification strategies on stock mispricing of listed companies, and uses the mesomeric effect model to explore the possible mechanism. In addition, this paper tests the robustness of the regression results by replacing the explained variables, eliminating the abnormal impact of the stock market, eliminating the impact of epidemic, and eliminating the endogeneity of instrumental variables. Finally, this article explores the heterogeneity of the impact of diversified business strategies on stock mispricing levels from three perspectives: the nature of corporate ownership, operational stability, and geographical location.

Keywords: Stock Mispricing, Diversification Strategy, Consumer Industry

Construction and Development Path of Zero-Carbon Water Park Under Carbon Neutral Target

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Abstract: The achievement of the peak carbon dioxide emissions and carbon neutrality is a solemn commitment that China's government has made to the world, and it is also an important choice for the economic and social development. The zero-carbon water park is a water conservancy scenic area that achieves zero carbon dioxide emission through carbon emission reduction, substitution, storage and recycling, etc. The construction of zero carbon water park is an active exploration to achieve the goal of carbon peak and carbon neutral in China, and an innovative practice of serving carbon neutral national construction. The construction of zero-carbon water park contributes significantly to achieve carbon peak and carbon neutrality in China, which has good theoretical guidance, practical basis and technical support conditions. To explore the construction of zero carbon water park, analyzes the necessity and feasibility of zero carbon water park construction, made clear about its construction to accurate to the carbon neutral goal, adhere to the system design, adopt measures suiting local conditions and sustainable development, set up the carbon emission standards, effective carbon absorption, reasonable carbon storage, the overall framework of carbon circulation flow. Put forward the development path of zero carbon water park: the government leads the preparation of special planning; the main organization implementation; audience interactive response to zero carbon action. The construction of "zero carbon water conservancy scenic area" is a long-term task of water conservancy scenic area under the background of carbon neutral. What is more important is to give full play to the resource advantages of water conservancy scenic area and take the lead in achieving carbon neutral and negative carbon discharge, then promote regional structural balance and high-quality development. Zero carbon water scenic area development in water ecological leisure tour, water culture, popular science education, stimulate the water saving has special advantages, to spread carbon neutral concept, promote extensive low carbon energy conservation and emissions reduction, for other key industries or surrounding areas to achieve carbon neutral carbon emissions quotas, help achieve carbon neutral in china.

Keywords: Carbon Neutrality, Zero-Carbon Water Park, Overall Framework, Development Path

Research on the Evolution of Natural Gas Trade Network in Countries Along the "Ice Silk Road"

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Abstract: Since 2017, China has become the world's largest natural gas importer. China still has a long way to go before "energy independence". With global warming, the summer sea ice coverage of the Arctic Ocean is decreasing year by year. Although the number of days during the annual ice free navigation period and the specific sailing time fluctuate, the airworthiness advantage of the Northeast Channel is gradually emerging, making it possible to use the Northeast Channel for commercial trade activities. Based on the natural gas trade data of 45 countries along the "Ice Silk Road" from 2012 to 2021, including pipeline natural gas and liquefied natural gas trade data, this paper uses social network analysis methods to study the topological structure characteristics, trade associations, and geographical spatial distribution indicators of node centrality of the trade networks of 45 countries along the "Ice Silk Road". The article also used the QAP matrix analysis method to study the factors affecting the trade network. The results show that: 1) The trade network gradually increases in density over time, with good interoperability and diffusion; 2) K-core analysis was performed on the condensed subgroups of the network. In 2012, the network could be divided into five partitions, with the highest core being 5-core. In 2021, the network could be divided into seven partitions, with the highest core being 7-core. The number of excluded countries decreased year by year. 3) In terms of trade influencing factors, per capita GDP differences, per capita carbon dioxide emissions differences, and logistics performance differences have significant negative impacts on natural gas trade; Urbanization level difference and population difference have a significant positive impact on natural gas trade.

Keywords: Ice Silk Road, Social Network Analysis, QAP Regression

To Trust or to Antitrust: An Evaluative Study of the Necessity of Antitrust Legislations

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Abstract: The late 20th century saw the rapid agglomeration of economic power with the emergence of large and formidable corporations. Key examples include Samsung Electronics in the Republic of Korea (RoK), and Toyota Motors in Japan. However, with their large market power, profit-maximising conglomerates could abuse their monopoly to increase profits at the expense of consumer welfare and innovation. In a bid to prevent anti-competitive practices, promote market efficiency, and protect consumer welfare, governments legislated antitrust laws to promote fair competition. Antitrust legislation, otherwise known as competition laws, is broadly defined as laws established to regulate business practices and the limiting of market power of firms in order to promote fair competition in an open-market economy. The role of antitrust law is to locate the optimal balance between the two objectives - economic decentralisation and economic synergy, in order to allow the economy to attain maximum efficiency. In theory, economic decentralisation fosters innovation and, ultimately, efficiency through the struggle for innovation, competitiveness, and survival among numerous small economic units. It discourages collaboration and requires the dismantling of all emerging concentrations of economic power into multiple component parts. Each of these small economic units will enter the struggle for survival and success. Economic synergy, however, is attainable through the joint efforts of numerous firms, whether they are bound by ownership or contract. This latter goal mandates the support of agglomeration of economic power and the advancement of economic concentration. Hence, it is often the case that only when the adverse economic impact of the joint ventures become obvious that the government as the legislator would intervene and respond to anti-competitive practices. Despite the general notion of the importance of antitrust laws, their implementation in Asian countries like Japan and Korea has yielded mixed results. In this paper, we explore the necessity of antitrust legislations, endeavouring to discover certain economic climates where antitrust legislations may be more beneficial than others, and the factors influencing the suitability and necessity of such legislations.

Keywords: Competition Law, Republic of Korea, Japan, Economics

A Study of China's Systemic Financial Risk Based on Stock Market and Bond Market

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Abstract: In the open and relaxed policy environment, the interrelation between financial markets has constructed a financial network system with homogeneity and complexity. The formation of this network has exacerbated the vulnerability among financial markets and further triggered the emergence of systematic financial risks. As the major financial markets, the stock market and the bond market can reflect the development of China's market economy to a certain extent. This paper constructs an index based on the dynamic correlation of the stock and bond markets to measure the degree of systematic financial risks in the two markets, from the linkage of financial markets to the contagion of systematic risks. It constructs a CoVaR model to study the spillover effect of risks between markets, and studies the impact of systematic financial risks on the correlation of the stock and bond markets. Finally, it puts forward effective suggestions on the early warning and prevention of systematic financial risks according to the current supervision situation of China's financial markets. The results show that there is a significant correlation between China's stock and debt markets. The correlation coefficient is mainly negative, with positive and negative changes frequently. Such changes will be more significant when major events such as financial crisis occur. Systemic financial risk spillovers are only dynamic risk spillovers from the stock market to the bond market between the two cities; The stronger the correlation between the stock and debt markets, the stronger the infectivity of the systematic risks, and the greater the impact on the change of dynamic correlation coefficient.

Keywords: Financial Markets, Dynamic Correlation, Systemic Risk, Risk Early Warning, DCC-GARCH, CoVaR

Research on the Impact of Climate and War Factors on the Price Trends of Agricultural Commodity Futures Based on the LSTM Model

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Abstract: *Objective:* Agricultural product futures are important indicators for measuring the development of the world futures market. However, existing research models on price fluctuations of agricultural products are highly dependent on crop stocks, resulting in a certain time lag. This article proposes a study on the impact of climate and war factors on agricultural product price trends based on predictive models, which can better capture price risks and volatility, reflect actual situations in a more timely manner, and predict future price trends more accurately. This helps farmers, markets, and governments accurately predict agricultural product prices, while also providing planting strategies, price adjustments, and price policies. *Methods:* This study examines the effects of climate on yields and predicts the effects of war factors, agricultural product yields, inventories, and imports and exports on agricultural price trends. We use time series VAR and OLS regression models to analyze the influence of climate on yield, and use LSTM model to predict the trend of agricultural prices. The following parameters are used in the LSTM prediction model: output, import and export volume, inventory, and economic uncertainty factors, in which the economic uncertainty index represents the impact of war factors on the price of agricultural products. *Results:* After completing the LSTM model process, this study obtained the loss value result after 100 iterations, and the evaluation result was RMSE (taking the average of 5 results): 0.386. At the same time, by observing the actual value curve and predicted value curve in the predicted result graph, it was found that the trend and range of corn futures prices are very close to the actual prices, indicating that the overall prediction effect is good. During the prediction process, it can be observed that the actual futures price of corn has a very significant upward trend, and the predicted price has also undergone changes in the same trend. At this time, the Russia-Ukraine conflict occurred, which led to the rise of corn futures prices. This also proves that adding war factors is helpful in predicting the trend of agricultural product prices, and can more accurately predict agricultural product prices. *Conclusion:* By calculating the data of experimental variables using different prediction models, it can be concluded that under relatively stable climate conditions, climate factors have a smaller impact on yield, but other factors such as policies, planting strategies, and war factors have a greater impact on yield. The empirical results also indicate that war factors have a significant impact on agricultural product prices and can affect the trend of prices. This also means that war factors can improve the accuracy of agricultural product price prediction in the prediction model.

Keywords: Agricultural Product Futures, Long Short-Term Memory Model, Prediction Model, Vector Autoregressive Model

Prediction of Macroeconomic Volatility Under the Influence of Major Risk Events Based on Mixed Frequency Regression Method

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Abstract: The impact of major risk events on macroeconomic fluctuations is multifaceted and may vary over time, events, and the scope of the event's impact. Macroeconomic fluctuations have a direct and significant impact on stock market fluctuations, and this impact is difficult to change by other influencing factors. At present, most of the time series data that reflect the macro-economy are quarterly or monthly data. This paper uses 10 time series that can describe the macro-economy in a monthly frequency to build a macro-economic fluctuation index, so as to more comprehensively reflect the macroeconomic fluctuations. At the same time, it studies that multiple indicators, including the money supply, unemployment rate and consumer confidence index, will have a greater impact on the macro-economy, At the same time, this article chooses to abandon the interpolation method that lacks the support of economic theory and preserve the volatility of high-frequency data. By using weekly data of net money supply to construct a monthly macroeconomic volatility index for mixed frequency regression prediction, and predicting the macroeconomic volatility of China's economy in the coming month through weekly data of net money supply, the downward trend of China's economic volatility can be obtained, Thus, it plays an important role in early identification, proactive prevention, and resolution of systemic financial risks, and can help investors invest more reasonably based on macroeconomic trends.

Keywords: Major Risk Events, Macroeconomic Fluctuations, Mixing Regression

Integrated Optimization of Variable Sampling Interval Control Chart and Equipment Maintenance Considering Equipment Failure

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Abstract: In order to reduce production costs and improve the monitoring efficiency of control charts for a production system composed of repairable single equipment, and considering the random occurrence of equipment failures during the production process, a joint decision-making study was conducted on variable sampling interval control charts and equipment maintenance. Firstly, by analyzing the correlation between statistical process control and maintenance management, and considering that fluctuations in product quality can indirectly feedback whether there are hidden dangers in the equipment, in order to dynamically adjust the inspection interval of product quality to detect process abnormalities as soon as possible, a variable sampling interval control chart is used for sequential inspection of product quality. Based on this, a joint strategy of variable sampling interval control chart and equipment maintenance is designed. According to this strategy, a joint optimization model of variable sampling interval control chart and equipment maintenance is constructed using the update reward theory, with the objective function of minimizing the average cost rate. Finally, genetic algorithm was used to solve the established joint optimization model, verifying the feasibility and effectiveness of the model. Finally, sensitivity analysis was conducted to determine the impact of each parameter on the optimal solution. This study not only helps managers develop reasonable maintenance plans and quality control methods, but also provides reference for enterprises to design management plans that balance quality control and equipment maintenance.

Keywords: Statistical Process control, Integrated Optimization, Variable Sampling Interval Control Chart, Preventive Maintenance

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